

JUNE 1961

ROCK

PRODUCTS



Case history of a blast page 92



Therm-O-Flex filter by WP
at plant in Barberton

Cement makers in Ohio... and in California...agree:



Precipitator by WP at
plant near Los Angeles

When DUST is your problem— CLEAR IT WITH WP*

For an efficient, economical solution to any dust control problem—look to Western Precipitation. WP is uniquely fitted to handle your unique problem—being the one organization that custom designs, engineers and installs ALL types of dust and fume control equipment: Precipitator, Mechanical, Jet-Cleaned Filter, Hi-Temp Filter, scrubbers and engineered combinations.

With no axes to grind for any one system, WP engineers will give your job a completely unbiased recommendation—whether it's a quote on your specifications, a single component, or a completely engineered installation... small, major, simple, or complex.

An inquiry—on your business letterhead—will bring you literature promptly. Just write Western Precipitation, 1000 W. 9th St., Los Angeles 54, Calif. (In Canada, write 8285 Mountain Sights Ave., Montreal, P.Q.)

Dust and fume control since 1907

*WESTERN PRECIPITATION

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Division of Joy Manufacturing Company

ELECTROSTATIC Precipitators
MULTICLONE Collectors
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TURBULAIRE Scrubbers
JOY MICRODYNE Scrubbers
also HOLO-FLITE Processors
HI-TURBIANT Heaters
TURBULEX Calciners



Battered bricks sent back for another beating

BATTERED, dog-eared bricks—not perfect enough for firing—ride that conveyor belt back to a pug mill for reworking. Though the load isn't heavy, belts were lasting only a year. Oil mixed in with the clay would soak into the belt, blister the rubber, rot the fabric.

When a B.F. Goodrich distributor heard of the problem, he asked the brick company to try a new lightweight belt, called Highseal, which BFG has developed originally for handling oily, greasy food products.

A special rubber compound gives this belt good resistance to oil, grease, moisture. The belt cover is tough, resists abrasion, cracking, peeling—never gets soft or sticky.

At last report, the B.F. Goodrich Highseal belt had been in service 5½ years, had saved the brick company the cost of at least four replacements.

If you would like to know more about this oil-resisting conveyor belt, check with your B.F. Goodrich distributor. He has full details. And, as a factory-trained specialist in rubber

products, he can answer your questions about any of the products B.F. Goodrich makes for industry. B.F. Goodrich Industrial Products Co., Dept. M-124, Akron 18, Ohio.



ROCK

PRODUCTS

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June 1961


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Making short work of loading truck, 4-yard P&H makes complete work cycles in 12 seconds.

Magnetorque swingers are the reason . . .

"4 yard P&H out-produces two 2½ yard shovels"

**... STOCKBRIDGE STONE COMPANY, Atlanta, Georgia
Division of VULCAN MATERIALS COMPANY**



Powerful P&H handles heavy rock with tireless ease as it works 16 hours a day digging and loading shot rock.

J. G. Lambert, Superintendent, has this to say about his operation—
"Our 4 yard P&H shovel, with Magnetorque swingers, accounts for more than half of the yardage produced at our Fortson quarry. It actually produces more than both of our other 2½ yard shovels combined."

12 to 15 seconds work cycles. Stockbridge Stone supplies aggregate throughout Georgia, Alabama, and to four company-owned plants that manufacture concrete blocks and ready-mix. Of prime importance to them is the speed and dependability with which their shovels can excavate rock and load trucks to keep their processing plants in production. This company reports that their P&H shovel loads 18-ton trucks in 5 or 6 passes with work cycles averaging 12 to 15 seconds.

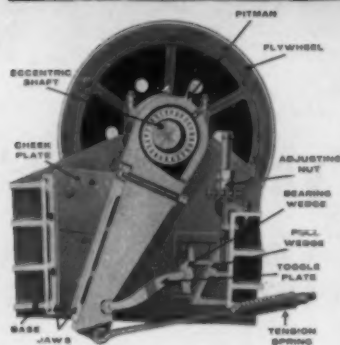
Edward Pitts, operator of the P&H says that Magnetorque swingers are the reason he gets better than 25% faster work cycles. He points out that Magnetorque swingers, unlike friction-type clutches, never over heat, and are not affected by temperature changes or load size.

P&H works two 8 hour shifts per day. To meet the heavy demand for aggregate, Stockbridge operates their 4-yard P&H shovel on a 16-hour day . . . and they operate in all types of weather, even the heaviest rains. This company has proven to itself that P&H delivers exceptional performance under the most rigorous conditions—steady, fast cycles with no downtime other than normal preventive maintenance.

Another feature, "Bud" Lambert stresses, is the propel brake on the P&H—this brake control gives more productive working time because it eliminates the constant need to "dog" or "undog" the machine with clumsy jaw clutches for every move.

For more information on this job, write for Case History 136.

HARNISCHFEGER P&H
Milwaukee 46, Wisconsin



Diamond Jaw Crushers in 12 Sizes

Capacities $1\frac{1}{2}$ to 500 tons per hour

6x12	10x36	24x36
10x16	15x24	30x42
10x20	15x36	36x48
10x24	20x36	44x48

**Diamond makes
everything for the
aggregate producer:**

Jaw Crushers • Roll Crushers •
Conveyors • Screens and Washers
• Feeders and Bins • Portable
and Stationary Crushing Plants
for Rock and Gravel.



*A Key unit
for full time
peak performance*

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Whatever the set-up and no matter how rugged the job, Diamond's "long-jaw" handles hardest rock with ease . . . day in, day out. A positive and uniform crushing cycle combined with quick jaw openings permits fast feed and discharge, insures full time peak performance . . . superior crushing records.

Diamond's Jaw Crushers are built to take it! The Pitman operates on a heat treated, forged alloy steel shaft and supports the moving jaws. Extra long and made of manganese steel, the jaws are easily changeable and reversible for longer service. A double row of adjustable Timken bearings for

both main and Pitman bearing assemblies carries the heaviest radial and thrust loads—a Diamond exclusive.

Records in hundreds of pits, quarries, construction jobs, prove that Diamond Jaw Crusher is a top performer. Its ability to take rough punishment and to produce greater tonnage per square foot of jaw area make it a profitable investment. If it's your responsibility to produce continuous tonnages and see that aggregate production costs are kept down, you'll want complete details on Diamond Jaw Crushers. Write for Catalog D-116 . . . no obligation.

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DIVISION

GOODMAN MANUFACTURING COMPANY
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**Another
DIXIE QUARRY
buys
NORTHWEST
again!**

YOU as a shovel user should wonder why it is that pit after pit across the breadth of these great United States buy Northwests, again and again, for the hardest work a shovel has to do—ROCK!

Here is the quarry of the Lewisburg Limestone Co., Lewisburg, Tennessee. Their business is rock! Their producing factory is their shovel equipment. It *must* be dependable! This is the second Northwest that Lewisburg has bought. Mr. Fred Moss says, "Northwest just can't be beat for day-in day-out rock loading without down time. The big Murphy Diesel just keeps going with a smooth purr and matched power for the loads." The Model 6 throws out 1500 tons a day of 8 hours for five and six days a week, year round! *Your Northwest is a real Rock Shovel!*

Take a look at it! The solid cast alloy Steel Machinery Bases with cast steel Machinery Side Frames are massive for a machine of this size. They take the shock of rock digging and eliminate constant re-

building. The Crowd—different, Dual Independent—an Automatic Crowd *plus* an Independent Crowd—utilizes force most Independent Crowds waste. Handles the tough digging with greater ease! Makes easy digging easier and gives greater output.

The big Uniform Pressure Swing Clutches let you put *all* the load in the truck. Note there is no spillage in the picture. There is the Feather-Touch Clutch Control that gives the true "feel" of the load in nudging the teeth under a big one or in probing a partly shot ledge of work.

There is much more to tell you. Details make equipment. Dig into them. A Northwest man is at your service.

NORTHWEST ENGINEERING COMPANY

1514 Field Bldg. • 135 South LaSalle Street • Chicago 3, Illinois

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NORTHWEST

NORTHWEST EQUIPMENT IS BUILT IN THE FOLLOWING SIZES



You can say... "THEY'RE ALWAYS
READY TO GO!"

**3/4 to 3
Cubic Yard Capacity**

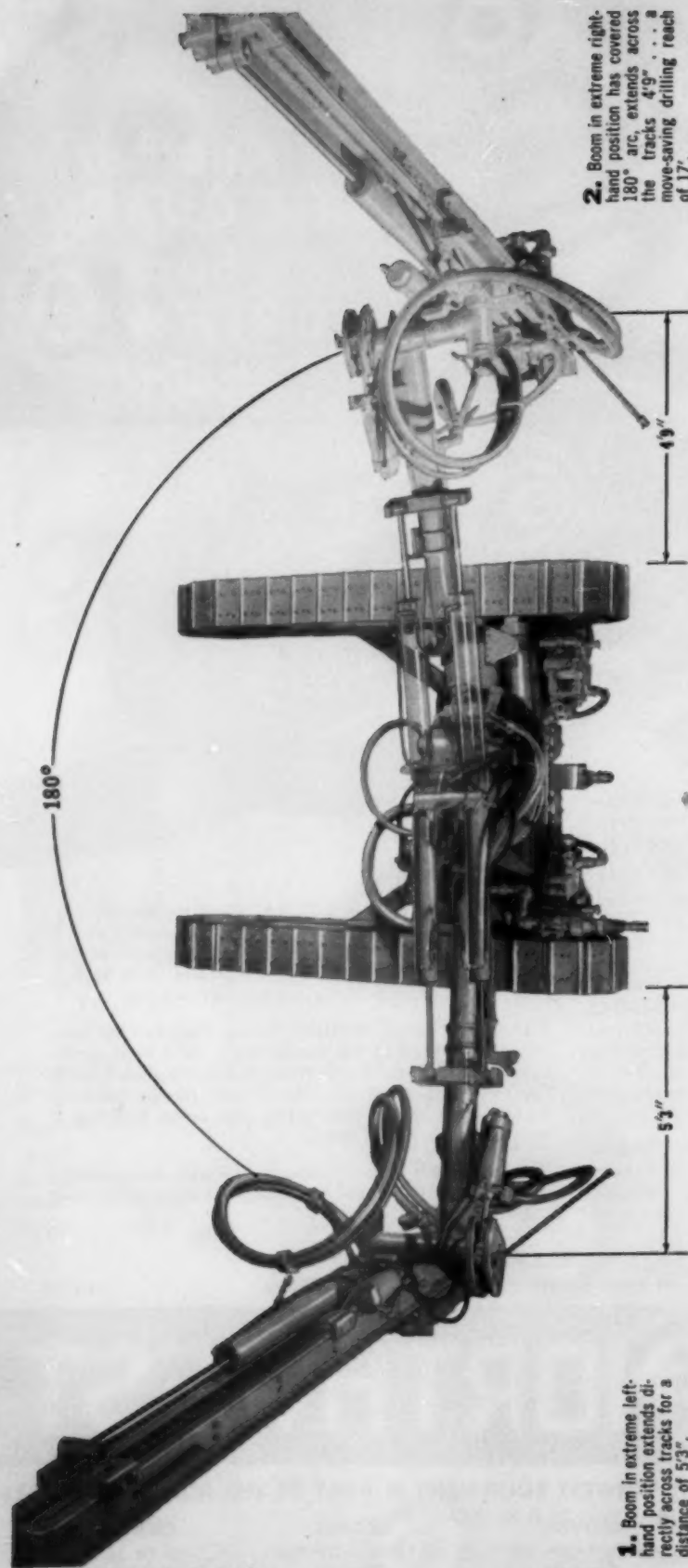
SHOVELS
¾ Yd. to 2½ Yd.
Capacity

PULLSHOVELS
¾ Yd. to 2½ Yd.
Capacity

CRANES
13-Ton to 60-Ton
Capacity

TRUCK CRANES
25-Ton and 45-Ton
Capacity

DRAGLINES
¾ Yd. to 3 Yd.
Capacity



1. Boom in extreme left-hand position extends directly across tracks for a distance of 5'3".

2. Boom in extreme right-hand position has covered 180° arc, extends across the tracks 4'9" . . . a move-saving drilling reach of 17'.

TRACDRIL'S 180° "BOARDING HOUSE REACH" PAYS-OFF!

More and more mining men are discovering that with the full 180° ground coverage of the G-900 Tracdril fewer moves are needed . . . that more blast holes can be drilled from every set-up.

In addition to the time-saving advantages of their 180° "Boarding House Reach", new G-900 Tracdrils have already gained an outstanding reputation for:

- Extra-long crawlers, 1350 sq. in. ground contact and knee-action . . . that take bad footing in stride.

- Remarkable ability to shift from straight verticals . . . to high horizontals, 11 feet at the face . . . or to snake holes at ground level.
- The time and step-saving advantages of two sets of grouped controls . . . one at turret, one at boom end.
- Heavy-duty brakes that lock and hold automatically the instant tramping throttle is released.

- You'll want a copy of Bulletin SP-3267 for G-900 Tracdrils, operating diagrams and dimensions. Write to:



Chicago Pneumatic

8 East 44th Street, New York 17, N. Y.

PORTABLE AIR COMPRESSORS • PNEUMATIC and ELECTRIC TOOLS
REICHdrills • THREE-CONE AIR-BLAST BITS • ROCK DRILLS

TRAYLOR FIRST



**Biggest primary gyratory crusher in 1919 and now . . .
big reason why it pays
to plan with Traylor in the changing 60's**

Industry seeking a crusher of capacity bigger-than-ever turned to Traylor and got it . . . 42 years ago. The 60-inch primary gyratory first built by Traylor then is still in operation—along with two others purchased since by the same customer. It is still the standard by which "big" crushers are measured.

Why so important now? One obvious

reason is, no one has a longer record of experience in this special field.

Of even greater importance: It's one of many important demonstrations of Traylor's being first with new and better equipment to meet changing production needs. You'll find many other examples throughout the industry—very likely right in your own plant. Do you use an all-welded kiln . . . a large ball mill, larger copper converter? All these are

Traylor "firsts," too. Traylor's proved capacity to pioneer sound innovations in kilns, mills and crushers is enhanced today by expanded research capabilities and process know-how.

An impressive record of historic "first" . . . plus what it takes to stay first for so many years . . . that's why it pays to call on Traylor first when you're planning plant improvements for bigger profits tomorrow.



See Chemical Engineering Catalog for details and specifications.

TRAYLOR ENGINEERING & MANUFACTURING

DIVISION OF FULLER COMPANY

1557 MILL STREET • ALLENTOWN 1, PA.

RT64
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ROCK PRODUCTS, June, 1961

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7

THE USEFULNESS OF A



HOW TO KEEP A JOB ON SCHEDULE

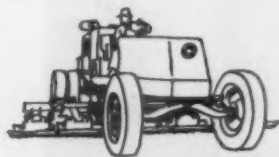
You need machines that work...and *keep* working! Nothing's more useless than a shovel or crane that's "down" when you need it most. Limas have a reputation for staying on the job. They're predictable because they *do* the work you schedule for them. You can count on them. Limas are better built, better engineered for dependable high production, trouble-free operation; favored by users everywhere to outdig, outlift and outlast other makes. Lima quality features include:

- Precision air control—insuring maximum production under the most adverse conditions; permitting feel of the load, instant response.
- Antifriction bearings at all important bearing points, including drums, brake and clutch housings.
- All gears, smaller parts and shafts are flame or induction hardened for longer life.
- Versatility—insuring *plus* value. Limas are not adaptations of single-purpose machines. Each is designed and built for top efficiency, long life with any front end.
- Design flexibility assuring complete transportability; easily dismantled to legal weights.

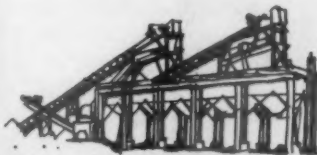
Call your Lima distributor and arrange to see a Lima at work. Or write us for details.



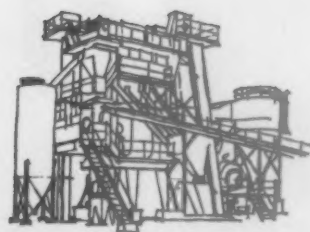
There's a Lima type and size for you—shovels to 8 yd.; crawler cranes to 140 tons, truck cranes to 80 tons, wagon cranes to 75 tons; draglines variable. Interchangeable front ends. Gasoline, diesel or electric power.



LIMA MODEL D ROADPACKER
—Six vibrating shoes consolidate fast, deep for profitable single-course construction; available in 12-shoe Super model.



LIMA AUSTIN-WESTERN portable and stationary crushing, screening and washing equipment; including jaw crushers, roll crushers, feeders, screens, elevators, conveyors, bins.



LIMA MADSEN ASPHALT PLANTS
—available in models with batching capacities from 1000 to 10,000 lb.

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Smidth

CEMENT COOLERS



The Smidth Cement Cooler, developed especially for cooling hot cement to temperatures acceptable for bulk shipment or immediate bagging, is externally water-cooled. The hot cement is introduced at the base and conveyed in a thin layer along the cooled interior surface to the top. High cooling efficiency is assured by the intimate contact of cement and the water-cooled surface.

The Smidth Cooler may also be used with many other similar dry pulverized materials.

Illustrated: Two 6' 6" diameter by 17' 7" high Smidth Coolers ready for shipment.



F. L. SMIDTH & CO.

INCORPORATED

ROCKEFELLER CENTER

1270 Ave. of the Americas, New York 20, N. Y.

WHAT'S HAPPENING

in other fields of interest to the rock products industry

Antarctica's ice may hide a vast treasure of minerals, to be tapped by future generations. Dr. Duncan Stewart, geology professor at Carleton College, Northfield, Minn., recently made his first trip to the region for government-sponsored research on the 187 minerals so far identified there. Dr. Stewart, for 20 years the world's leader in antarctic petrography (the microscopic description and systematic classification of rocks), reports a highly mineralized shield area corresponding to that of Canada. Sixteen minerals of potential commercial value have been found, one of which is uranium ore. Various types of marble and granite are quite plentiful, and topaz and fluorite probably indicate the presence of tin.

"Instant beer" is one of chemistry's latest boons to mankind. Recent experiments at Union Carbide Corp. resulted in a dehydrated synthetic beer concentrate, similar to frozen orange juice, to which the user simply adds water and CO₂.

Peat has entered the building field in such far-apart lands as Russia and Scotland. A report in *Cement & Lime Manufacture* (Nov. 1960, p. 86) claims that in rural Russia peat-ash cement is made by grinding a clinker processed by adding 5 percent crushed limestone (which can come from any source) to the peat. When burnt, the lime reacts with the peat-ash to form calcium silicates and aluminates. While the clinker is being ground, 5 percent gypsum or plaster is added, and the product is then used as a binder for local building materials and for making plaster The Scottish Department of Agriculture reports success in developing a peat-cement concrete, useful in the Western Islands, where conventional building materials have to be transported long distances and peat cleared from the site. Ground peat is used in a 3 to 1 ratio with cement, with 10 percent lime and 1 percent calcium chloride as additives. Reports indicate that a test cottage in Skye is bearing up well under rigorous weather.

1960 was a hex year for many contractors. A record number—2,607—succumbed to failure, exceeding even the totals racked up during the Depression. Especially alarming was the zoom in large-size failures, those over \$100,000. These shot up to 67 percent over 1959. General building contractors were hit to the tune of 36 percent, and the total of all construction contractors going under was up 26 percent from the preceding year. According to this Dun & Bradstreet report, the midwest and far west supplied the greatest number of casualties, while New England presented the cleanest record.

Please turn page

What's Happening

continued . . .

"Filtered through fossils" might well be the slogan of many a manufacturer of drugs or beer or silver polish. From the White Hills in Santa Barbara County, Calif., Johns-Manville Corp. and the Dicalite Div. of Great Lakes Carbon Corp. are mining and processing billions of tiny plants—fossilized diatoms. These prehistoric single-celled algae were enclosed by two valves of silica, which they extracted from their undersea environment. Almost pure silica, they enjoy the outstanding features of light weight (10 lb. per cu. ft.), great absorption (several times their own weight) and tremendous specific surface (less than $\frac{1}{2}$ lb. of diatoms has a surface equal to 45,000 sq. ft.). Filtering and insulation are but two of many possible uses for this "miracle earth."

Functioning as an atomic "disposal" is a specially-designed, remote-controlled concrete mixer made by T. L. Smith Co., a Milwaukee firm. In this mixer, dangerous radioactive waste materials are blended with concrete, which is then poured into steel drums and disposed of at Government-approved locations.

Can you imagine a load of 1 million psi? Scientists at the National Bureau of Standards are developing techniques for measuring ultra high pressures. This involves improving the accuracy of pressure values at transition points where important physical, chemical or crystalline changes occur. For instance, above 500,000 psi. almost all fluid materials become solid. More dramatic metamorphoses—entirely new chemical compounds; brittle quartz becomes ductile; an electrical insulator changes into a semiconductor; graphite turns into diamond.

Riprapping the Oahe Dam's 90 million cu. yd. upstream embankment, with a slope of one on three, presented a really thorny problem. But the contractor—Missouri Basin Construction Co.—thought of lowering the end-dump trucks on 600 ft. of $\frac{3}{4}$ -in. wire rope from a power winch on the rear of a heavy-duty crawler tractor. The trucks, kept in gear at all times, deposit their loads as close as possible to the final position. Engineering News-Record's report (Feb. 9, 1961, p. 45) mentions that 728,000 tons of riprap, 95,000 tons of spalls and 90,000 tons of filter blanket are being placed under the \$2.7 million contract.

Great wealth in aluminum may soon be coming from ordinary clay and coal shales. Olin Chemical Corp. is perfecting a process whereby alumina can be extracted from these materials, when activated by sulphuric acid, with fewer steps than needed by conventional techniques. At present, bauxite ore—most of which must be imported—is the basic source of aluminum products.

Heated sidewalks have grown into heated highways! In November, Britain's first stretch of heated highway will be open to motorists. The electrical wire embedded in the road is supposed to keep it dry and ice-free.



Q: What do Goodyear Earthmover Rims have that no others have?

A: MORE times FOUR

1. MORE rims on the job: More tons are hauled on—more earth-moving equipment rides on Goodyear rims than on any other kind. Result: You reap the benefits of the widest, soundest experience in rim design, manufacture and use.

2. MORE kinds of rims: Maximum rim performance stems from proper specification. Goodyear makes the *only complete line* of earthmover rims. Result: The choice that permits you to get exactly the right rim for the job.

3. MORE rim engineering help: Goodyear has more engineers designing *and selling* rims than any other company. And they know tires, too. Result: The help you need in choosing the right rim for top performance—longer tire life.

4. MORE rim "firsts": The first *true* earthmover rim, the first 5° rim, the first tubeless rim—in fact, every major earthmover rim advance was made by Goodyear. Result: The very latest in rim design and manufacture at work, for you.

What better reasons for choosing Goodyear as your rim supplier? Only these: The desire and ability to design and build any rim that may be needed for *tomorrow's* earth-moving equipment. No matter what your rim needs or plans, you'll find it pays to call on Goodyear. See your local rim distributor, or write: Goodyear, Metal Products Division, Akron 16, Ohio.



GOODYEAR
EARTHMOVER RIM
FEATURES:

40% stronger, only
6% heavier

Heavy-duty, nonslip
band driver

Positive air seal

Corrosion-resistant
Bond-A-Coat finish

Lots of good things come from

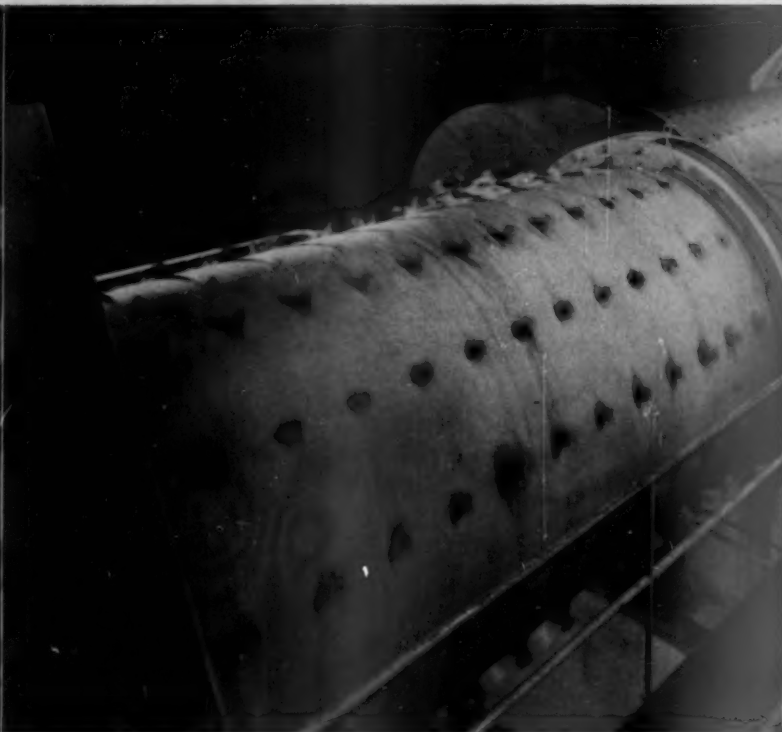
GOODYEAR



ideas and news:



Low-Head screen with direct mounted motor: A completely integrated screening unit is this new, LOW-HEAD horizontal screen with direct mounted motor. No supporting structure, no belt tensioning or alignment problems plus headroom saving, smooth starts and stops, easy accessibility for maintenance. Another example of engineered screening from Allis-Chalmers.

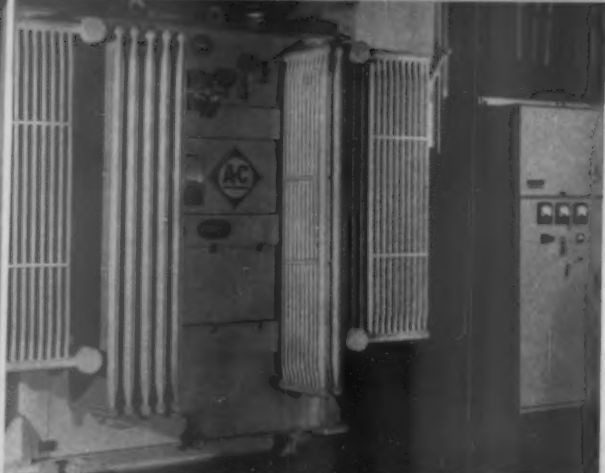


Rod mill's debut in cement "society": Two Allis-Chalmers overflow rod mills are being used by a Michigan cement company to wet grind cement raw materials in open circuit. Several other cement companies too are using them — all report substantial savings in labor and power requirements and a more uniform product. Biggest advantage of rod milling is preparation of sized feed for the tube mill, permitting the BALLPEB mill to grind satisfactory rotary kiln feed in open circuit.

Which of these productive ideas could be working for you?

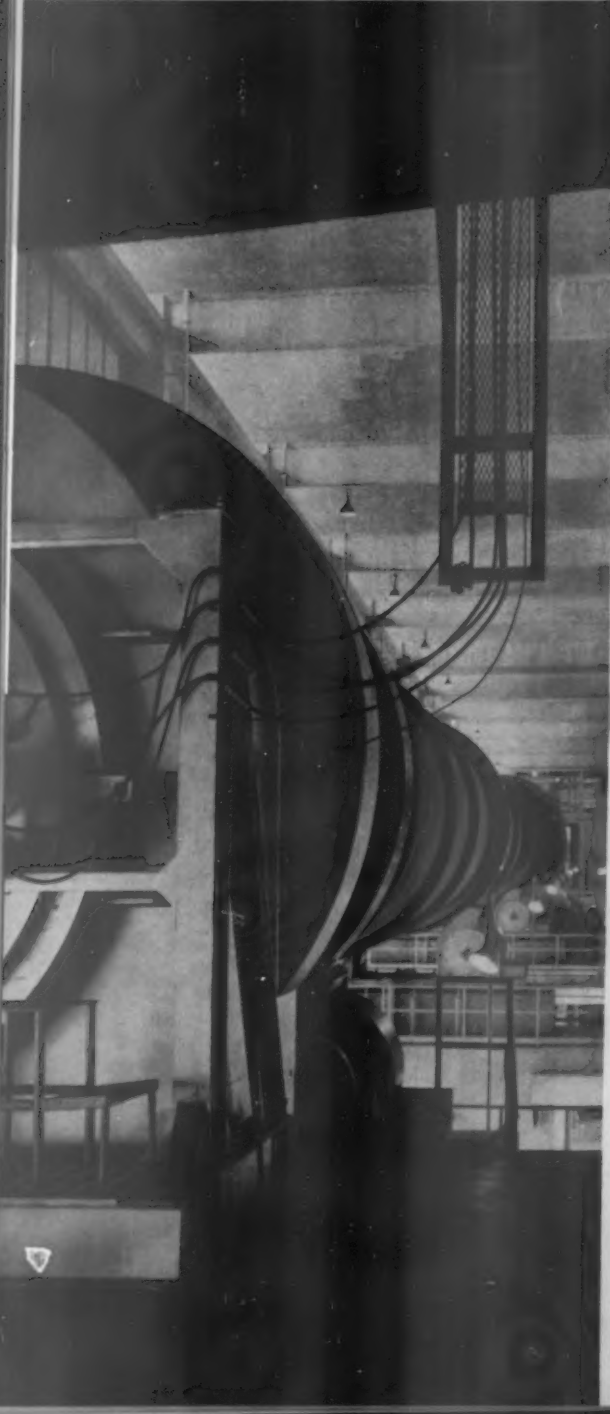
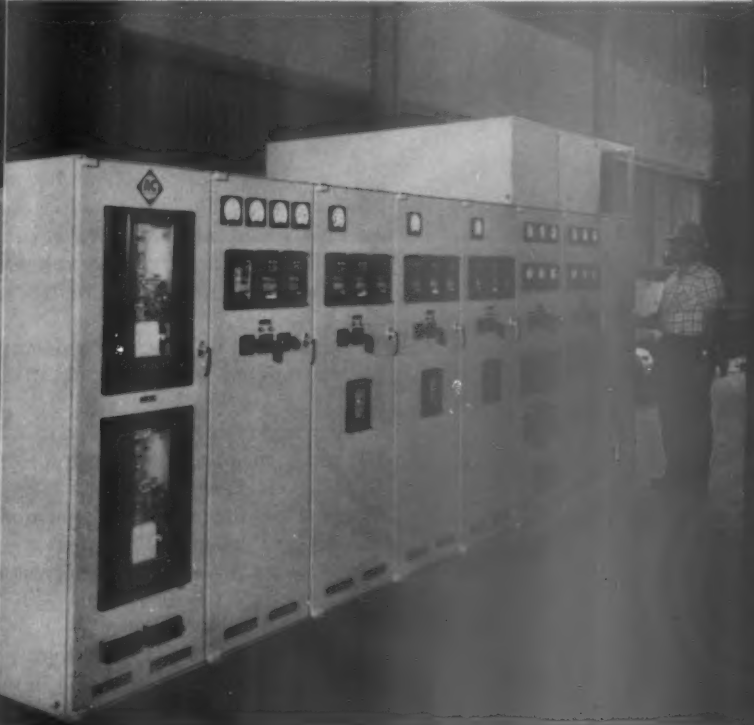
Screen with direct mounted motor. New ideas in kilns. Grinding mills that cut cement production costs. These examples demonstrate the extra value that is standard with A-C...the greater efficiency and the added productivity which are yours when you buy A-C products, systems and services. Call your Allis-Chalmers representative for details on A-C "worth-more" features. Or write Allis-Chalmers, Industries Group, Milwaukee 1, Wisconsin.

A-1482



◀ **A-C transformer offers multiple benefits:** Located close to the load center in a Midwest cement plant, this 5000-kva CHLOR-EXTOL filled transformer provides reduced power losses, better regulation, and flexibility for expansion. Types available also include oil-filled, liquid-filled, and dry-type units (both sealed and open).

Lowest height, easiest access — 5-kv metal-clad switchgear. Just 72 inches high . . . you get eye-level instrumentation, shoulder-height accessibility. Has front-accessible current transformers — maximum compartmentation and dead-front construction for greater safety. Choice of stored energy or solenoid operated circuit breakers.



◀ **New A-C kilns have many innovations:** Latest A-C rotary kilns feature: expansion type ring gears, removable firing hood faces, hydraulic thrust mechanisms, dual drives to overcome critical speed vibrations and independent hydraulically adjustable carrying mechanisms to keep roller faces in proper contact with riding ring face. New ideas in kiln engineering mark each new kiln from A-C.

ALLIS-CHALMERS PRODUCTS: Look to Allis-Chalmers for compressors, controls, crushers, earth-moving equipment, electrical distribution equipment, engines, generators, industrial systems, kilns, lift trucks, mills, motors, pumps, rectifiers, screens; thermal, hydro and atomic electrical generating equipment; tractors, transformers, unit substations.

ALLIS-CHALMERS

EDITORIAL

by George C. Lindsay

Fortune favors the brave

LIKE YOU, we sat expectantly before our TV and watched Cmdr. Shepard rocket toward the heavens. We heard his voice come by radio from the cold unknown of outer space, and later we saw him happy and smiling after his historic rescue at sea from that miserably small cubicle. And we were happy, and proud.

How fast we are progressing, we thought! Such "speed" of progress is terrifying, with challenge after challenge compounding one upon the other so rapidly that our catalogue of problems changes almost daily. Can we take it? Will we as a society be able to handle several sets of brand new problems before we have mastered the multitude of old ones?

We can, we believe, but this rapid pace of progress highlights the need for courage to solve our "old" problems more quickly.

Turning from the TV and Shepard to our own little area of practical business, we pondered the problem of machine application in our industry. Some producers are paying a big price for the lack of progress, we thought. They're paying more to keep obsolete misfit equipment at work than it would cost to amortize new machines! Worse yet, they're losing daily advantages in cost and operations that new, improved machines would bring.

Why, we wondered, is industry so far behind in this area? Not because the equipment is unavailable, nor economically unattainable. Probably because we've been unable to pierce the Brass Curtain with news of savings opportunities here, due primarily to management's lack of information on true engineering and cost analysis.

The rock products industry is not the only one that is plagued with this "old" problem. A recent research report disclosed that the proportion of all industry's equipment that is more than 10 years old has been increasing at the rate of 2 percent annually since the end of World War II. It's now 68 percent; it was 38 percent in 1945.

We agree with President Kennedy's statement: "We must start now to provide additional stimulus to the modernization of American industrial plants." Especially in the rock products industry, management must regain its courage to stem the tide of high costs that lack of progress brings.



MORE JOB • **LOWER** • **WITH THE**
VERSATILITY • **OPERATING COSTS** • **'EUC'C-6**



EUCLID C-6 LOWEST COST

Saves time and labor . . .

Job proved components and unsurpassed accessibility for day-to-day maintenance, as well as major repair work, keep downtime and operating costs to an absolute minimum. There's a big difference between the C-6 and its closest competitor . . . for example:

Service accessibility . . .

Fast, easy access to major components cuts repair and replacement labor.

- save 7 hours on radiator replacement
- change a drive sprocket 5 hours faster
- 17 hours saved on recoil system replacement
- engine replacement in 6 hours less

These are typical times for removal and replacement without the prior removal of any integral components . . . think what these savings in time and labor can mean in lower operating costs and increased productive work time!

Power train . . .

Proven components . . . GM 6-71 engine, Allison Torqmatic Drive and Euclid planetary final drive . . . dependable, efficient and balanced, it delivers more of the rated engine horsepower to the drive sprocket than any comparable power train . . . and parts and service are readily available to owners everywhere!

Lower cost engine parts . . .

Individual engine parts, such as pistons, rings, liners and connecting rods, are up to 72% less in cost than for more limited production engines . . . a fan-to-flywheel engine replacement costs only one-half to two-thirds as much in the C-6!

See a "EUC" C-6 at work and see the big difference that pays off in lower cost!



TRACTOR IN THE 200 H.P. CLASS ...and the most versatile, by far



DOES MORE WORK...and a better job on more kinds of work

Because the C-6 is the most versatile crawler in its class, it's a more productive tractor. Matched power train...full-power shift...fast-as-a-fox response...better balance with any attachment...and easy operation...these are features that enable the C-6 to handle more work better and more efficiently.

When it comes to over-all productivity...on all kinds of tractor work...the "Euc" C-6 has earned a reputation for remarkable performance. Owners and operators alike report that it has more versatility and is more useful for a wide range of work from side sloping to the heaviest dozing and ripping.

You really have to see a C-6 at work to see what this versatile crawler can do in getting more work done...cutting costs and protecting your profits!



'EUC' C-6 VERSATILITY CUTS CRAWLER COSTS

No other crawler in its class can do so many jobs so well at such low operating cost . . . no wonder this Euclid is the talk of crawler users everywhere!



Form No. 609-P Printed in U.S.A.

EUCLID

DIVISION OF GENERAL MOTORS, HUDSON, OHIO
Plants at Cleveland and Hudson, Ohio and Lanarkshire, Scotland

ROCKY'S NOTES

by Nathan C. Rockwood



Character of calcium hydroxide determined by hydration

ONE OF THE SIMPLEST CHEMICAL REACTIONS with which practically everyone is familiar, is conversion of calcium oxide into calcium hydroxide by adding water to quicklime (CaO), or quicklime to water (H_2O). Heat is evolved, and the product is hydrated lime, or calcium hydroxide $\text{Ca}(\text{OH})_2$. Apparently nothing could be simpler. Yet, every manufacturer of lime, and probably most users of lime, know that limes do not hydrate alike—because, not only do the oxides differ, but the temperature and quantity of water used for hydration have important effects.

Perhaps, as complete a study of the effects of water temperatures, and methods of hydration as there is available, is that made by T. C. Miller, technical director, Industrial Sales Div., National Gypsum Co., Buffalo, N.Y. His paper, "A Study of the Reaction Between Calcium Oxide and Water," was the 1960 winner of the Victor J. Azbe Lime Award of the National Lime Association. The Association has recently published the paper, and we presume those most interested can obtain a copy by writing to the National Lime Association, Washington 5, D.C. We are not sure whether there is any charge for it, but undoubtedly the supply of copies is somewhat limited.

The contents of the paper, and the reason for his study, are best explained by the author in the following quotation from his introduction: "It has been known for many years that the physical properties of settling rate and specific surface [of calcium hydroxide] may vary over a relatively wide range with slight variations in a hydration process, but these variations have never been studied in the effort to establish laws by which these variations take place. The data from industrial processes indicated that some law may exist by which these characteristics could be controlled and maintained. This paper deals with the results of such a study in slaking calcium oxide in an excess of water to produce an aqueous suspension of calcium hydroxide. It is not the intention at this time

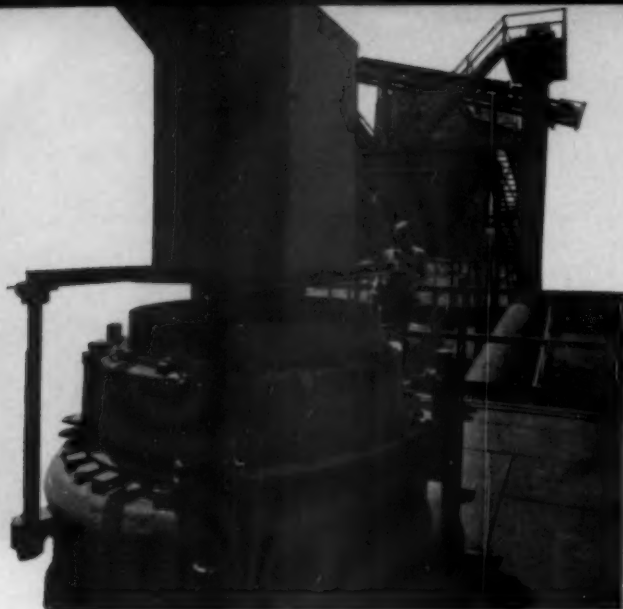
to include the results from a study of the dry hydration process [that is the manufacture of a dry hydrate]."

It should be recognized at the start that Mr. Miller's particular results, as such, apply only to the particular lime he studied; for each calcium oxide, because of its impurities, degree of calcination, method of calcination, etc., will differ somewhat from all others. The interesting and valuable feature of the paper is his method of approach, and the usable sales information that any lime producer may obtain for his particular product by similar studies. Furthermore, it is an example of the fact that no single chemical reaction or industrial process is too simple to yield valuable data when equally thorough study of it is made. Most of the useful research in the rock products field must inevitably be of this character.

The standard method of determining particle size of hydrated lime is the settling test in some liquid medium—usually water, since lime is nearly insoluble in water. This test takes too much time for use as a control test, so Miller found the Blaine air permeability method for specific surface a satisfactory substitute after the tests had been correlated. There is, however, a factor involved in the settling rate, not shown in the Blaine test—the viscosity of the water suspension of lime. Miller discusses this in some detail, which is most interesting because it is the property of lime suspensions and lime putties which give them colloidal properties. He accounts for it by the formation under specific conditions of flat lime hydrate crystals of minute size.

Our author has worked out mathematical formulas—tentative laws—whereby control of the amount and temperature of the water in the hydrating process may be used to give the hydrate the specific properties desired as, for example, a quick settling or a slow settling lime suspension (milk of lime). Some industrial processes require

Please turn to page 136



FOR REDUCTION CRUSHING

Symons* Cone Crushers are built in both Standard and Short Head types, in sizes from 22" to 10' in diameter. Capacities to 1500 or more tons per hour.

Illustrated is one of many Symons Cones used for the profitable, big tonnage crushing of slag.

Assure profitable production of Aggregates, Crushed



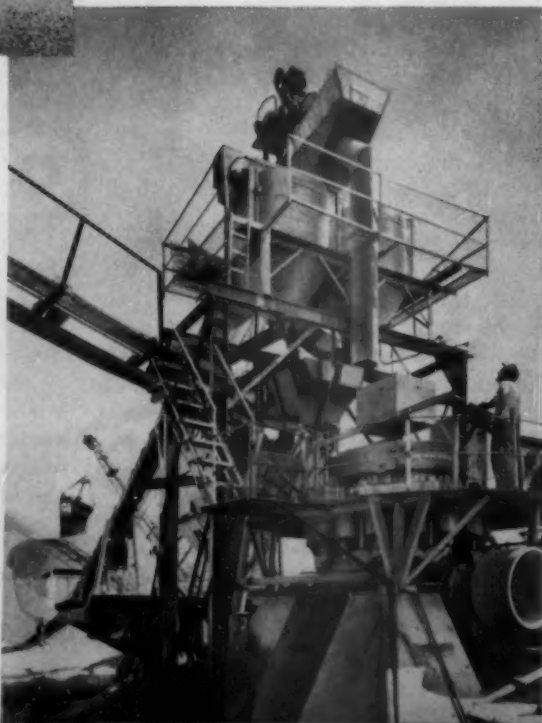
FOR PORTABLE PLANT SERVICE

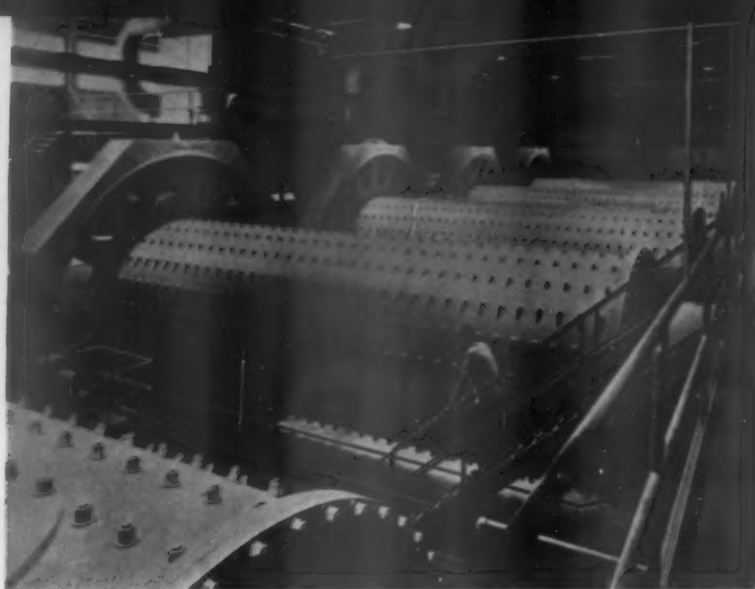
Increasing numbers of portable plants are built using Symons Cone Crushers for big capacity of fine product . . . such as the portable crushing plant at left, which utilizes a 4' Symons Cone Crusher and a Symons Horizontal Vibrating Screen.

FOR SCREENING

From scalping to fine screening, there is a Symons Screen built to do the job at low cost. In the illustration at right, two Symons V-Screens* are used in conjunction with a 54" Gyradisc* Crusher* to handle a daily production of up to 500 tpd of manufactured sand and a filter medium . . . both "premium" products made from previously unsalable torpedo gravel.

*Gyradisc Crushers are used for volume production of fine specification material often supplanting the need for comminution by grinding mills.





FOR WET AND DRY GRINDING

Nordberg Grinding Mills include Rod, Ball, Pebble, Tube and Compartment types, in sizes up to 13' in diameter and up to 50' in length.

Shown at left are five 12' x 36' Nordberg Mills installed in a 5 million bbl. per year wet process cement plant in Michigan. These are the largest grinding mills ever built.

Sand and Cement with NORDBERG MACHINERY

FOR PYRO-PROCESSING

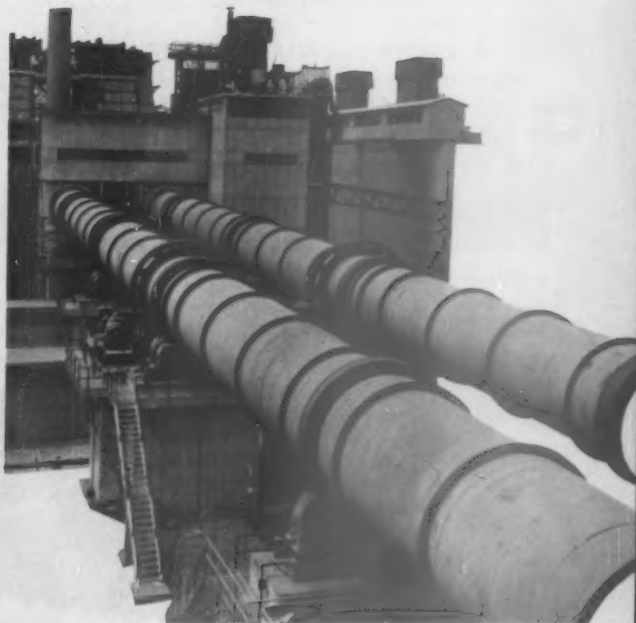
Nordberg Rotary Kilns and Dryers for pyro-processing and calcining cement, lime and other materials, are manufactured in various diameters and lengths to meet specific requirements.

The two Nordberg Kilns at right are 11' x 360' units, serving a midwestern cement manufacturer.

FOR POWER GENERATION

Nordberg two and four cycle engines are built in sizes from small 10 horsepower units to over 12,000 horsepower in a single engine . . . for Diesel, Duafuel® and Spark-Ignition Gas operation.

Below is a 4425 bhp, 3150 kw Nordberg Engine installed in a large Texas cement plant.



*SYMONS . . . a registered Nordberg
Trademark known throughout the world.*



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PROFIT 7 WAYS WITH SIMPLICITY GRIZZLY TYPE FEEDERS

1. FEED AND SCALP WITH ONE UNIT
2. ELIMINATE PLUGGING OF CRUSHER
3. REDUCE LOADING HEIGHT
4. PROLONG BELT CONVEYOR LIFE
5. LOWER MAINTENANCE COST
6. LOWER INSTALLATION COST
7. SAVE SPACE—COMPACT



Simplicity Grizzly Feeders are designed to convey and scalp in one operation, thus eliminating the costly apron feeder and separate stationary grizzly. Fines are scalped off and pass through the grizzly section, allowing only the oversize material to reach the crusher. Fines are deposited on the conveyor belt first, making a bed for the larger rock, thus contributing to longer belt life.



Simplicity Grizzly Feeders are spring mounted, which allows for heavy impact without damage to the machine. Impact bars will be added to the pan section at customer request. Side liners are standard at no additional cost.

Simplicity Grizzly Feeders are equipped with replaceable grizzly sections, which allows for various openings by simply changing deck sections, or the ALL NEW ADJUSTABLE Grizzly section which is so designed that one or more of the grizzly bars can be taken out, or added, to arrive at the opening desired.

Simplicity Grizzly Feeders are available in four separate models and in sizes for most operations.



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WASHINGTON LETTER

by Edgar Poe

Voluntary Pension plan Legislation

The 87th Congress may enact a new version of the Keogh Bill to provide income tax incentives to encourage engineers and other self-employed persons to establish their own voluntary pension plans. The Keogh measure in a different form was passed by the House in the 86th Congress. Subsequently, it was altered by the Senate Finance Committee and sent to the floor. It was being debated there at the time Congress adjourned for the two major political conventions last summer at Los Angeles and Chicago.

The newest version of the Keogh bill—officially entitled the "Self-Employed Individuals Retirement Act"—embraces a somewhat different approach than was considered in previous Congresses. Instead of allowing the self-employed a limited tax deduction for amounts voluntarily set aside for their retirement, either in restricted trusts or insurance or annuity policies, the new proposal would bring self-employed persons under existing legislation relating to non-discriminatory, tax-favored private retirement plans by allowing them to be treated as their own employers and employees.

The author of the bill, Rep. Eugene J. Keogh (D-N.Y.), a member of the House Ways and Means Committee, has long been an exponent of granting self-employed person tax benefits for setting up their retirement programs similar to those extended to corporate employees.

Sponsors Car safety Belt drive

A renewed effort to require the equipment of all federal government vehicles with seat belts is being made. The Chairman of the House Safety Subcommittee, Rep. Kenneth Roberts (D-Ala.), is once again sponsoring a proposal to require belts installed in all government-owned cars and trucks.

Representative Roberts sponsored a similar measure at the last session. It passed the House but died in the Senate. The Alabaman maintains that adoption would protect the government work-

ers and "help crack the resistance barrier" to more safely designed cars. Meanwhile, the U. S. Forest Service credits seat belts with saving the lives of at least 100 of its employees. Almost 75 percent of the Forest Service cars are now equipped with safety belts, and the Internal Revenue Service plans to require belts on all automobiles now on order.

Automation Office Established

An office of automation and manpower in the Department of Labor has been established under Deputy Assistant Secretary Seymour Wolfbein. The new office will examine all phases of employment and unemployment, with particular focus on the effects of automation and other forms of technological change on the labor force. Specifically, it will develop programs for improving testing, counseling, training, and placement of workers who have been displaced by automation or who may not possess the skills needed as a result of technological developments. It will also serve as a clearinghouse for materials on technological developments, hold conferences with employers and workers affected by technological change, and prepare informational materials on the problems connected with automation and technological change.

SBA undergoes Some policy Changes

The Small Business Administration under its new director, John Horne of Alabama, is undergoing some policy changes. The House Small Business Committee, controlled by Democrats, recently described the agency's policies under the Eisenhower Administration as "unduly strict" and "a detriment" to the Federal Small Business Loan Program.

With perhaps a show of politics, the House Committee charged that the SBA approved only 47 percent of loan applications during the last fiscal year. Many of the others were snarled in red tape and strict credit requirements, according to the Committee.

Please turn page

Washington Letter

continued . . .

Dixie has Best water Resources

A review of Southern water resources, published as a circular by the Geological Survey, shows Dixie to be one of the world's most favored areas for optimum supplies of ground water. Precipitation through most of the South exceeds 40 in. a year, compared with the national average of 30 in. In much of the southeast, it exceeds 50 in. Accompanying this large potential source of usable water are favorable geologic conditions for replenishment and underground storage.

Phillip E. A. LaMoreaux, chief of the Survey's ground water branch and author of the report, divides the south into three areas: (1) the Blue Ridge and Piedmont—oldest geologically and having the smallest ground-water potential; (2) the Appalachian Ridge and Valley and the Appalachian Plateau—underlain predominantly by compact, consolidated shale, sandstone and limestone; and (3) the Atlantic and Gulf Coastal Plain, underlain by tremendous volumes of relatively unconsolidated sediments capable of producing many billions of gallons of water per day. It is this third area which the author labels "the sleeping giant" among our Nation's water sources, with a great potential for fulfilling future needs.

Need for Improving Dam concrete

Reclamation Commissioner Floyd E. Dominy asserts that the Bureau's publication on the design of small dams is proving popular. At the same time he said the Bureau recognizes there is a need for fundamental information on the behavior of rock foundations of large dams, "so that we can design those dams more precisely." Here is some other pertinent information to the rock products industries and to engineers, which Commissioner Dominy cited in a prepared paper.

Soils are our most abundant—and among our most important—engineering materials for dams, canal linings and structure foundations. The science of soils engineering is very young and much fundamental information is needed. While the Bureau can now design earth dams with the assurance that they will be safe and serviceable structures, our scientists report that there is still a great and prompt need for basic research in the engineering and chemical properties of soil.

Lined irrigation canals are expensive. Yet, in unlined canals as much as 50 percent of the water is frequently lost by seepage enroute to the farm. We need a soil sealant that could be economically

applied either in a dry canal or without unwatering the canal to reduce this seepage. Of course, we are always looking for cheaper ways to line our canals to avoid waste in conveying the water from the reservoir or stream to its destination.

Bureau construction consists principally of moving earth and placing concrete. There is still disagreement among engineers regarding the fundamental concepts used in the design of reinforced concrete. On large dams, there appears to be disagreement regarding both the allowable stresses which can safely be used and the method of computing these stresses. Research is necessary to reduce the uncertainties, so as to permit lower factors of safety and thereby achieve greater economy in construction. The International Commission on Large Dams is doing a great deal to provide a better understanding of the various practices used throughout the world.

There is a continuing need for improving concrete so that structures can be built cheaper and last longer. As an example we need a concrete that is more resistant to the sulfates often found in high concentrations in soils of our western states.

Wage bill Faces tough Sledding

The minimum wage bill of President Kennedy, one of the Chief Executive's five "must" bills for this session of Congress, appears to be heading for some rough, tough sledding. The proposal, which would increase the minimum wage from \$1 an hour to \$1.25, is being opposed by Democrats in high places on Capitol Hill. The measure also would be broadened to bring under its provisions several million additional workers.

Sen. J. William Fulbright, chairman of the Senate Foreign Relations Committee, maintains that higher United States wages would result in new restrictions on imports, and make the position of this country less competitive with foreign countries.

Bank makes Loan to Peru

A \$5.5 million loan to Peru to improve road transport between the Amazon area in Eastern Peru, and Lima the capitol, has been made by the World Bank. The loan also will finance the cost of conducting preliminary studies for the improvement of an adjoining 324-mile section of the highway. The new all-weather road is expected to accelerate development of the central part of Peru's Amazon area.

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from

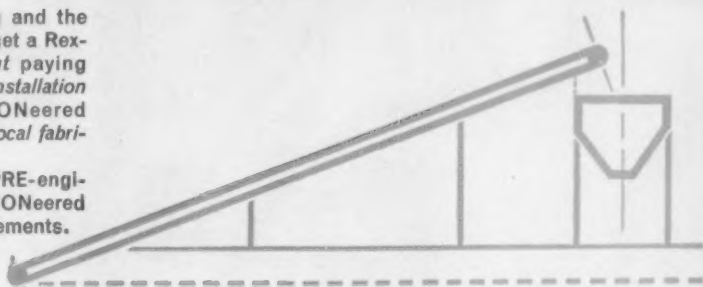
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Providing more bail pull, maximum dipper fill factor, low per-ton loading cost—Magnetorque Hoist Drive on 17-year-old P&H 1400 refuses to show its age.

After 17 years, first Magnetorque equipped

... at MISSOURI PORTLAND CEMENT CO.



**Virgil Wendt,
Quarry Supt., reports—**

"Back in 1944, we bought the first P&H ever sold with Magnetorque; today this 1400 still gives us good, reliable service. If our plant needs extra limestone, we think nothing of work-

ing this shovel for 16 hours at a stretch. We still rely on it to do the job for us. Teamed with the P&H 1500 we bought in 1958, it gives us as efficient a digging operation as you'll find anywhere."

Two P&H Electrics Load 1,123,000 Tons Annually

To meet quarry production schedules, Missouri Portland's modern, five-million barrel cement plant demands absolutely dependable equipment. Two

types of rock must be dug daily to supply the right "mix." To accomplish this, the two P&H Electric Shovels work at different levels along an 1835 foot long quarry face.

Equipped with a 4-yard dipper, the P&H 1400 has seen years of hard, workhorse service. One year it loaded over 750,000 tons. Now it digs at the base of the quarry's upper face, loading up to 360 tons of limestone an hour. The newer, 5-yard P&H 1500 digs at the base of the lower face, loading up to 400 tons of limestone an hour without hesitation.

Magnetorque Helps Maintain High Production

Exclusive Magnetorque Hoist Drive on these P&H machines is the key to their greater productivity. It gives more digging bail pull—puts more material in the dipper faster, with every pass. Mr. Henry Merz,



20-ton capacity trucks are loaded at the rate of about 15 loads per hour. P&H 1400 with 4-yard dipper shows it's still a workhorse.

Quick, accurate dipper spotting results from responsive electronic controls on 5-yard P&H 1500. Loads 18 to 20, 20-ton trucks per hour.



P&H electric is still going strong

Fort Bellefontaine Quarry in St. Louis County

Quarry Foreman, says—"The electronic controls on our P&H shovels are very responsive and the Magnetorque hoist drive is especially powerful."

Superior P&H Parts And Service Is Worth A Lot
Mr. Virgil Wendt has this comment to make—"I think one big reason the 1400 is still going strong is that P&H really stands behind its equipment with immediate help, should it be necessary. This is worth a lot. Harnischfeger not only builds a good shovel, but helps keep it working right."

Summary Report On 17 Year Old P&H 1400

Here is how Mr. H. Clay Iten, Plant Manager, puts it—"We have no plans to replace our P&H 1400 after all these years. It's always done a good job for us; it's doing a good job for us now, and we expect it will continue to do so."

Compare all performance factors before you buy—for more detailed information on this operation, write for Case History Report No. 141 to the World's Largest Builder of Full-Electric Shovels.

HARNISCHFEGER

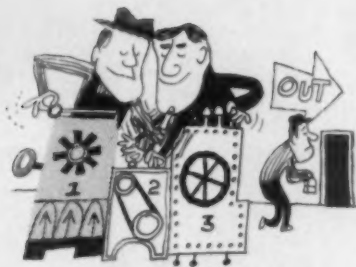
Milwaukee 46, Wisconsin



LABOR RELATIONS

A roundup of actual day-to-day in-plant problems and how they were handled by management men

How would you decide?



Has management the right to consolidate two jobs, and require 2 men to do the work that 3 men previously did?

What Happened: In the interests of efficiency the company decided that it would combine three jobs so that the work could be done by two men. These jobs were alike in character. Job descriptions existed for each. The union claimed that this couldn't be done because:

1. It was not feasible to operate with only two men.

2. These three jobs had been in existence for five years so a precedent had been established.

The employer countered:

1. It's not for the union to decide whether certain job combinations are feasible or not. It is the company's responsibility.

2. Management has the right to decide how many men will work on certain jobs.

3. There's nothing in the union contract to prevent us from combining jobs.

Was the company:

Right? ☐ Wrong? ☐

What Arbitrator Ross ruled: "In analyzing a case of this type, it is important to begin at the right place. The basic issue is whether

the company may combine two of the three jobs. The proper point of departure is the principle that an employer has the right to decide how many men he needs to perform the work unless he is restricted by the law or by the collective bargaining contract.

"Arbitrators have construed some collective bargaining contracts as prohibiting combination of positions. Such contracts include a list of job classifications and job descriptions for every classification in some instances. These Arbitrators have reasoned that these provisions constitute an agreement to freeze allocation of job duties for the duration of the contract. Other Arbitrators hold that a listing of job classifications and duties merely provides the basis for compensating workers and does not impair management's right to rearrange the work.

"Coming back to the central question, this Arbitrator can find no limitation on the right to combine or eliminate one of the jobs."

Can you fire an employee for stealing when the criminal charge against him has been dismissed?

What Happened: The plant-protection department received a phone call which hinted that Harry Smith had stolen some materials from the company. Management asked a deputy sheriff to search Smith's home. One item was found which had the company initials stencilled

into it; there was no mistake.

When Smith was questioned, he first admitted—and then denied certain thefts. His son-in-law's testimony was damaging. "Sure Pop took some things from the company. Why, you can see the cut in the company's fence where he passed them through." When the plant-protection crew investigated, they found the cut in the fence.

The company filed criminal charges against Smith, but these were dismissed for lack of sufficient evidence. At the same time, the company suspended—and then discharged Smith. He protested his discharge:

1. The dismissal of the criminal charges against me shows that the company's accusations aren't true.

2. The items which were supposed to be stolen could all have been part of the batch of used items which I purchased.

The company supported its disciplinary action by arguing that it has the right to make its own assessment of the evidence against the employee.

Was the company:

Right? ☐ Wrong? ☐

What Arbitrator Grant ruled: "The company is justified in asserting its right to evaluate the evidence itself. The district attorney's decision not to prosecute frees the accused of the criminal charge, but cannot shield him from disciplinary action by his employer. Harry Smith was dismissed for proper cause."

Please turn to page 34



PRODUCTION — NEW STRENGTH FOR SOUTH KOREA

Private enterprise is turning South Korea into an industrialized, highly productive country, to the benefit of all her people.

This is exemplified by the Mungyong plant of Korea Cement Manufacturing Company, Ltd., which operates two F.L. Smidth rotary kilns, each 3.15 • 2.85 • 3.15 metres dia. x 123 metres long.

"MAGNECON" kiln liners, uniquely the product of Canadian Kilmar magnesite, are used in the hot zones of these kilns.

The "MAGNECON" liners contribute substantially to economy of operation by giving roughly five times the service life of previously-used refractories.

A recent report from Korea Cement, covering 335 days of service, concludes "The quality of 'MAGNECON' is superior and satisfactory."

CANADIAN REFRACTORIES LIMITED
CANADA CEMENT BUILDING, MONTREAL, CANADA



Write for technical folder "MAGNECON", the hot zone refractory to keep your kiln on the line".

ADVANCED PLANT DESIGN STANDS 11-YEAR TEST FOR LOW COST PRODUCTION

Half-mile long Barber-Greene belt conveyor system runs on original idlers, cuts handling costs at Elmhurst-Chicago Stone Co. plant

"Our maintenance cost per ton on the Barber-Greene conveyor system has been extremely low for 11 years, and not a single carrier has been replaced," says an Elmhurst-Chicago Stone Co. official. "We have been so satisfied with the operation of our Barbers Corners plant that we've virtually duplicated this layout at our Warrenville plant," he comments.

Hailed as an industry showplace when it started operation 11 years ago, the Barbers Corners truck shipping plant is still a model for low-cost production of sized aggregates.

Today, only two men are required to operate the plant. One directs production of concrete building

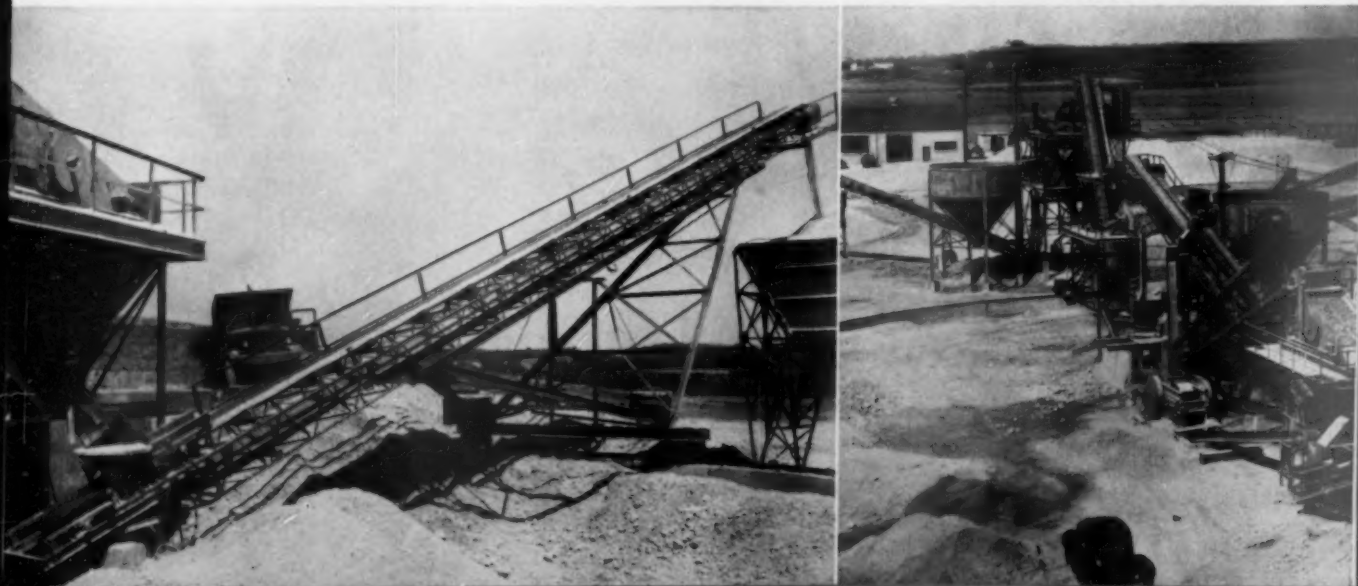
aggregates, and a second man handles facilities producing asphalt mix aggregates.

Elmhurst-Chicago Stone Co. has been an aggregate producer for 77 years, and is currently operating four plants in the Chicago area.

Get this same lowest-cost-per-ton solution to your material handling problems by calling in your Barber-Greene Conveyor Specialist. He sells pre-engineered standardized conveyors plus 40 years of experience in designing and building specially engineered systems—a preferred combination throughout the industry.

Barber-Greene stackers are used both to fill truck-loading bins and to build stockpiles. All are power-propelled and operated by remote control.

Fully mechanized crushing, washing, and screening plant shows how Barber-Greene belt conveyors move materials through each phase of processing.





Aerial view of Barbers Corners plant shows how six Barber-Greene radial stackers build huge circular stockpiles that allow maximum storage capacity in minimum space.



SEND FOR NEW IDLER BULLETIN

New 44-page Idler Bulletin describes the more than 800 units available in the complete Barber-Greene line, tells how their years-ahead features bring longer life and greater economy to every job. Ask for your copy today.

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Main Office and Plant **AURORA, ILLINOIS, U. S. A.**
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CONVEYORS • LOADERS • DITCHERS

ASPHALT PAVING EQUIPMENT

Labor Relations

continued from page 30



Can an employee get sick-leave pay for time spent having a physical examination?

What Happened: "Say, I'll have to take Wednesday off," Bob Humphries said to his supervisor on Monday. "I've got to go see the doctor. I made the appointment a month ago."

"Okay, the work load for this week looks pretty normal," said the foreman. "You're not sick, are you?"

"No," answered Humphries. "I'm not sick, but I just think I better get a general check-up. You know how it is. I'll get sick-leave pay for the day, won't I?"

"No, I don't think you'll get paid for the day."

When Humphries returned to work on Thursday, he gave the foreman a company form signed and dated by the doctor stating that Humphries "was ill and under my care . . . and unable to work." When the foreman again asked him if he'd been sick, Humphries said, "No." Later the superintendent asked him if he'd been sick. "No," he replied. "But my legs have been troubling me. I was afraid I might have arthritis. It's a relief to know nothing is wrong with me."

The company ruled that Humphries was not entitled to a day's sick pay—so he filed a grievance with the following arguments:

1. The agreement says "an illness must be certified by a licensed practitioner before payment will be made for sick leave. The certificate must state that

the employee was unable to work."

2. I submitted the doctor's certificate on the company form as required. The company can't contradict the certificate. Management saw this grievance as a threat to the reasonable—but limited—purpose of the sick-pay allowance. It argued:

1. The agreement provides that "if an employee is absent because of illness on regularly scheduled working days, he may use his 'sick-leave' credits."

2. The purpose of sick pay is to help the worker when he loses regular pay because of illness.

3. Humphries said he wasn't ill. He had the appointment for a month. If he were ill, he wouldn't have waited that long.

Was the company:

Right? ☐ Wrong? ☐

What Arbitrator McCoy ruled:

"It is perfectly clear from the agreement that sick leave is payable only to employees who are unable to work because of sickness. Since Humphries admittedly was not sick, the contract gave him no right to sick-leave pay. The provision requires that a certificate be submitted, but does not state that such certificate shall be conclusive and final. The grievance is denied. Humphries is not entitled to be paid."

Must you give unlimited training to a senior employee who bumps into a job for which he is not qualified?

What Happened: When Ed Somrak received notice that he was being laid off, he looked up his foreman. "What about this lay-off business? 'I've been here a lot of years, and I've done a lot of jobs. According to the contract I can take the job of anyone with less seniority. I want Bill Morand's job.'"

The supervisor asked Somrak for time to check into the matter. Later that day he gave the

employee his reply. "It's true that you have the seniority, but you aren't qualified for that job. It would take two months to train you and the company can't afford that kind of business. Sorry, but you are laid off."

Somrak filed a grievance in protest. He stated:

1. The agreement provides that "in the event that work becomes slack . . . the last employee hired shall be the first employee to be laid off."

2. Seniority is plant-wide and is not restricted in its application to the job classifications.

3. My jobs in many parts of the business have made me quite familiar with all duties.

The company supported its layoff of Somrak with the following arguments:

1. The agreement provides that "persons retained or rehired because of seniority must be willing, competent and qualified to perform the work remaining to be done."

2. An employee is "competent and qualified" to bump into another job if he can do that job with no great training.

Was the company:

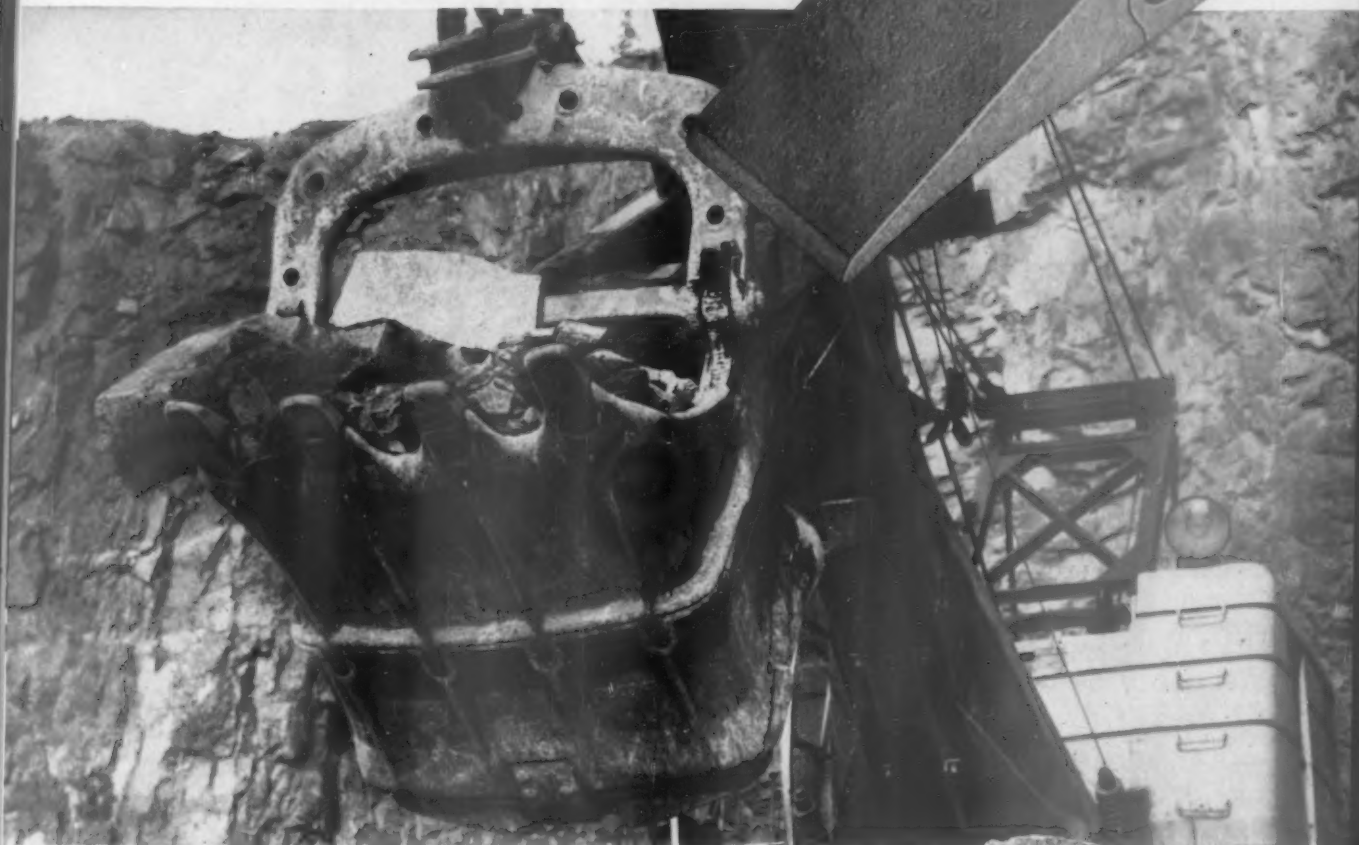
Right? ☐ Wrong? ☐

What Arbitrator Ross ruled: The principal question is whether employee Somrak is qualified to perform the duties of the job. This means that he must be able to step up to the job and make a normal performance after a brief period of orientation because he has held down the same job or a basically similar job in the past. The employer is not required to furnish any specific amount of training. The company has shown that Somrak would require two months to achieve proficiency. The preponderance of evidence is that Somrak is not competent to perform the job without lengthy training. Grievance denied."

END

AMSCO Simplex... best by test

Simplex Tips handle twice the tonnage of former make teeth in North Carolina Quarry ... without reversing



Digging is rough in a North Carolina limestone quarry and shovel tooth wear is a real problem. To solve this wear problem several sets of a competitive 2-part teeth were tried. The shovel handled six to seven thousand tons during the life of these tips. Two sets of Amsco Simplex were also tested in the same pit, on the same shovel. The first set of Simplex tips dug 12,445 tons *without being reversed*. The second dug 13,920 tons *without reversing*. Twice the tonnage of competitive teeth tested. In addition the owner stated that the Simplex teeth had a better fit between the adapter and dipper and it took less time to change tips.

If you are experiencing costly dipper tooth wear, order a set of Amsco Simplex Teeth and we think you will find them "best by test." If you don't know your nearest Amsco dealer, write us, and we'll send you his address plus a copy of Amsco's Buyer's Guide for Simplex Teeth.



Amsco Cast Manganese Steel Dippers

You can be sure of long and dependable service even under the most abusive conditions when you specify an Amsco Cast Manganese Steel Dipper for a new or used shovel. Sizes from $\frac{3}{4}$ to 12 cu. yd.

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AMERICAN
Brake Shoe
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In Canada: Joliette Steel and Manitoba Steel
Foundry Divisions
In Mexico: Amsco Mexicana, S.A.

PEOPLE IN THE NEWS



Dundee Cement promotes Ostberg and Chase

Werner Ostberg (left), plant manager, has been elected vice president-operations of Dundee Cement Co., Dundee, Mich., and Raymond S. Chase (right), sales manager, has been named vice president-marketing, according to an announcement by Roblee B. Martin, president.

Mr. Ostberg was born and educated in Denmark. He is a graduate of Odense-Maskinbygnings

Technikum in mechanical engineering. He was engineer and plant manager of the Alexandria Portland Cement Co. in Egypt when he accepted appointment as plant manager at Dundee in May 1959. Previously, as project and field engineer, Mr. Ostberg worked on several cement plants throughout the world for F. L. Smidth & Co.

Mr. Chase, a native of Wenatchee, Wash., and a graduate of Washington State University with a degree in architectural engineering, was national manager of advertising and sales promotion of the Masonite Corp., Chicago, prior to joining Dundee in 1959 as sales manager.



Bishop succeeds Eells as Basic president

Warner B. Bishop (left) has been elected president and a director of Basic, Inc., Cleveland. He succeeds Howard P. Eells, Jr., (right) who was named chairman of the board and chief executive officer. Mr. Bishop was formerly vice president-sales.

Matthew J. Ludwig, vice president-controller, was also elected a director of the company.

Meighan succeeds Oesterle as Penn-Dixie superintendent

James C. Meighan has been appointed general superintendent of the Buffalo, N.Y., plant of Penn-Dixie Cement Corp., New York, N.Y. He was formerly assistant plant superintendent and succeeds Albert A. Oesterle, who has retired after 28 years of service with Penn-Dixie and 47 years in the cement industry.

Mr. Meighan joined Penn-Dixie in 1952 as plant engineer at Bath, Pa. He became assistant superintendent at the Buffalo plant in 1956.

Mr. Oesterle joined the old Federal Portland Cement Co. in 1933 as general superintendent and continued in that capacity when the company was purchased by Penn-Dixie in 1955.

Marblehead Lime elects senior vice president

Milton R. Mathews has been named senior vice president of Marblehead Lime Co., Chicago, Ill. He was formerly vice president of sales and will be succeeded in this position by Maurice James O'Brien.

Mr. Mathews has been with Marblehead for 55 years. He started in 1905 as a clerk in the traffic department, was appointed sales manager in 1922, secretary in 1938, and vice president in charge of sales in 1947.

Mr. O'Brien was formerly president of Bulk Chemicals Co. before coming to Marblehead.

Please turn to page 41

NOTICE

Rock Products subscribers, Concrete Products subscribers, and prospective subscribers

We have been informed that a Mr. Thomas Kelly has been representing himself illegally as being affiliated with Rock Products or Concrete Products magazines. It is also believed that he may have used the name of Tom Ryan. We've had reports that he sells subscriptions to both magazines.

In the knowledge of the present publisher, this Mr. Kelly is not now, nor never has been, associated with Rock Products magazine or any of its affiliated publications. Under no circumstances should he be given cash or a check for a subscription. If he presents himself as a representative of either magazine, please call us collect immediately at RAndolp 6-2802 in Chicago, Illinois

GARDNER-DENVER MAKES THE NEWS

ALL NEW ROTA-SCREW

Portable air compressors



Gardner-Denver engineers a proved principle into a totally new design in portable air compressors

Lowest maintenance ever!

No touching parts . . . no valves . . . no pistons . . . no blades to inspect or replace.

Instant compressed air!

Flip a switch to start; turn knob for immediate warm-up. Flip a switch to stop . . . automatic blowdown.

Pulsation-free air flow!

Continuous delivery of compressed air in a new, efficient manner . . . vibrationless operation.

Off-level operation!

Oil circulating system permits operation on angle—uphill or down.

Saves fuel!

"THRIFTMETER"® control matches engine speed with air demand.

All-weather operation!

Tested for 40° below to 115° above zero.

THREE MODELS

SP900—capacity: 900 cfm.
SP600—capacity: 600 cfm.
SP125—capacity: 125 cfm.



GARDNER - DENVER

QUINCY, ILLINOIS



*See why
the Rota-Screw
is the compressor
for you*

You get new economy...new efficiency... new durability with Gardner-Denver's new Rota-Screw compressors

The Rota-Screw operates without metal-to-metal contact in the compressor chamber. Rotors are separated by timing gears, held to precise clearances between rotors and casing by heavy-duty bearings. Absence of blades, pistons, valves and other reciprocating parts extends compressor life, reduces maintenance to a trifle. Costly, pesky, blade inspection or replacement completely eliminated.

Oil flooding of rotors seals air in, removes heat of compression. Single-stage compression eliminates start-up problems—and there are no complicated interstage air passages.

SPECIAL CATERPILLAR ENGINES—Rota-Screw compressors are driven by turbo-charged, 4-cycle, 1800 rpm engines. Caterpillar-designed especially for Gardner-Denver Models SP900 and SP600 rotary screw compressors.

SHOCK-ABSORBING COUPLING—no clutch—rubber block drive provides smooth power transmission between engine and compressor.

DE-AERATING RADIATOR—removes air from the water to supply a solid stream of water for cooling the compressor oil and the engine.

FAIL-SAFE, 24-VOLT ELECTRICAL SYSTEM—if fault occurs, unit will not start . . . will shut down if running.

EASY COLD-WEATHER STARTING—engine equipped with glow plugs and ether starting aid system.

IMPROVED RUNNING GEAR—extra-heavy running gear with automotive-type steering. Heavy-duty truck tires resist punishment of rough terrain.

DRY-ELEMENT-TYPE AIR FILTERS—shortens servicing time on filters.

ADDITIONAL IMPORTANT FEATURE—units are designed for accessibility . . . featuring grip handles and step plates for top service.

THREE MODELS



Model SP900 . . . 900 cfm



Model SP600 . . . 600 cfm



*Model SP125 . . . 125 cfm
(Turn wheel optional.)*

How Rota-Screw compresses air



A time-proved principle forms the basis for Gardner-Denver Rota-Screw compressors. As air enters the intake port, it is drawn into the space between lobes of two helical rotors. The revolving rotors force the air into successively smaller interlobal spaces, thus compressing the

air in a single stage until full compression is reached at the outlet port. As this air is expelled, the next groove comes into line with the outlet port to assure a smooth air flow without pulsation—cycle after cycle. Compressor operates without vibration . . . air tool performance improves.

Water-oil cooling system

Gardner-Denver's effective water-oil cooling system provides constant operating temperature for both engine and compressor under all climatic conditions from -40° to $+115^{\circ}$. Discharge air temperature is normally kept between 170° F. and 190° F. with average operating conditions at 100 psi. Combined oil receiver and separator preserves oil supply, cleans air of oil.

SPECIFICATIONS

Model	SP900	SP600	SP125
Capacity at 100 psi	900 cfm	600 cfm	125 cfm
Engine	Caterpillar D343T	Caterpillar D333T	Continental F-266
Length	13'7"	12'1½"	12'1"
Width	6'8"	6'	5'4½"
Height	8'½"	7'	5'5"
Track	5'8"	5'	4'8"
Turning radius	12'	8'	—
Net weight	13,775 lb.	9,150 lb.	2,980 lb.

For complete specifications, write for Bulletin SP-1.



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There's a right Victor rod for each of your hardfacing jobs . . . and the accompanying chart helps you select the proper one to use in rebuilding worn parts on earthmoving equipment, crushers, dredges, etc. You'll find Victor rod easy and fast to use, thus saving labor and time on machines tied up for repair. Order a supply from your Victor dealer today.

FREE. Blow-up of this chart (size 14"x20") suitable for wall mounting, yours for asking; also copy of "Practical Guide to Hardfacing."

Write today.

RODS FOR MANUAL APPLICATION

Equipment or use	These conditions	Use this Rod	Application
Crusher rolls, jaws, hammers, liners, mantles	Severe abrasion & impact	VICTOR Crusher Rod	AC-DC Elec. only
Earthmoving, drilling tools, rippers, augers, ditchers, excavators, loaders	Severest abrasion	VICTORTUBE (Tungsten Carbide)	Gas AC-DC Arc
Earthmoving tools, brick augers, conveyors, mill guides	High abrasion; sliding friction	VICTORITE	Gas AC-DC Arc
Crushers, grinders, mixers, scrapers, fan and screw conveyors	Abrasion and impact	TUBE VICTORITE	Gas AC-DC Arc
Cement pumps, brick dies, dry bearings & journals, expellers	Heat; abrasion, corrosion	VICTORITE 1	Gas AC-DC Arc
Crusher & dredge parts, bucket teeth. A tough low-cost hardfacing	Severe impact; abrasion	VICTORALLOY	Gas AC-DC Arc
Crushers, bucket lips & teeth, miller tires, dozer blades, dredge pumps	High abrasion; medium impact	VICTORALLOY #1	Gas AC-DC Arc
Clutch parts, gears, latches, pins & keepers; build-up for hardfacing	Angular shock; extreme impact	VICTORALLOY "A"	AC-DC Arc only
Tractor idlers, sprockets, rolls, crusher parts, pump casings, impellers, liners	Heavy impact; moderate abrasion	VICTORALLOY "B"	AC-DC Arc only
Cement screws, gudgeons, drag chains, pressure rolls, mixer blades & paddles	High abrasion; moderate impact	VICTORALLOY "C"	AC-DC Arc only
Drill tools, crawler pads, crushers, mine rails; build-up for hardfacing	Severe impact; compression	VICTOR Multi-pass (for Build-up)	AC-DC Arc only
Hardmetal underbase for manganese steel parts on crushers, dredges, dippers	Severe impact; compression	VICTOR Ni-Mn (for Build-up)	AC-DC Arc only
Low-cost "stainless" joining rod for crushers, dippers, crawlers, dredges	Severe impact	VICTOR Ni-Mn (for attachment)	AC-DC Arc only

WIRES FOR AUTOMATIC & SEMI-AUTOMATIC APPLICATION

Equipment or use	These conditions	Use this Wire
Crushers of all types, tool joints, millers	Severe abrasion; moderate impact	VA 0
Scrapers, bucket teeth crushers	Abrasion & compression with impact	VA 1X
Dredge rolls, cable sheaves	Severe compression & impact with abrasion	VA 2X
Mill guides, crushers, grinders	Severe abrasion & compression with impact	VA 3
Build-up on trunnions, tractor idlers & tracks	Severe impact & compression	VA 4X
Shovel rollers, tractor rollers & idlers	Severe metal-to-metal impact & abrasion	VA 5X
Build-up on mine car wheels & tractor rollers	Severe impact & compression with abrasion	VA 7X
Dozer blades, scraper blades, tool joints	Earthworking abrasion & impact	VA 8X
Tool joints, crushers, scrapers, swing hammers	Extremely severe abrasion; moderate impact	VA 10
Tool joints, scraper blades, augers	Maximum abrasion; earth cutting, scraping	VT 60 (Tungsten Carbide)
Build-up manganese steel parts for overlay or to size	Wear, all types manganese steels	Ni-Mn (Hadfield)



for hardfacing

Profitable dealerships open; inquire now!

VICTOR EQUIPMENT COMPANY

Alloy Rod & Metal Division

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H-76

People in the News

continued from page 36



Huron appoints new director of research and development

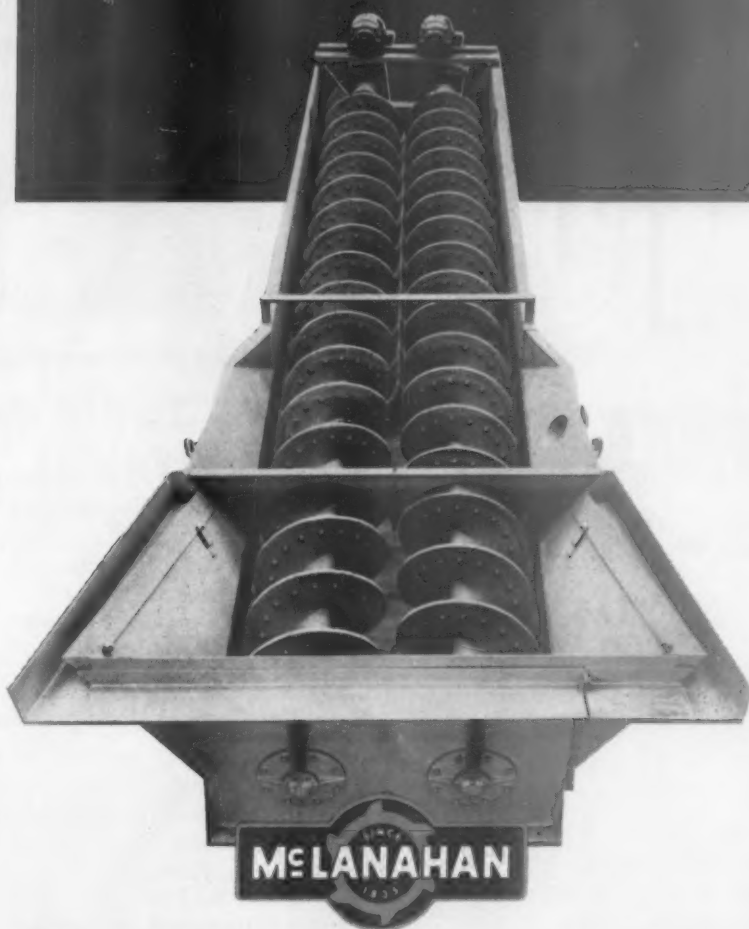
Richard E. Galer, (above) has been appointed director of research and development for Huron Portland Cement Co., Detroit, Mich. He succeeds Francis A. McAdam who passed away February 12. A chemical engineering graduate of Michigan State University, Mr. Galer was formerly chemical engineer at Huron's Alpena plant. Prior to joining Huron in January 1960, he served on the production research staff of Wyandotte Chemicals Corp.

Brown joins General Crushed Stone engineering staff

Charles B. Brown has joined the engineering staff of The General Crushed Stone Co., Easton, Pa., as assistant materials engineer. He was formerly operations assistant for The New Enterprise Stone & Lime Co., New Enterprise, Pa. In his new position, Mr. Brown will furnish technical field service for the company's operations in the states of New York, Pennsylvania, Delaware, Maryland, Virginia and New Jersey.

Please turn to page 42

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HIGH-PROFIT TONNAGES
for you



Screw Washers

• *Superior System for Controlling Fines*—low turbulence, extra-large flared settling area, adjustable overflow weirs • *Rigidly Constructed Box* • *Improved Drive*—fully enclosed, with all gears running in sealed oil bath, simplified direct-shaft reduction • *Durable Screws*—renewable hard-iron, spiral steel flights with segmented wearing shoes on extra-heavy pipe shaft.

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Corporation

HOLLIDAYSBURG, PENNSYLVANIA

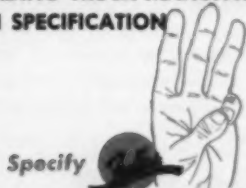
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Specify the MODEL
Get the 3-speed auxiliary
designed for your job.*

**HIGH CAPACITY ... WIDEST RANGE
OF RATIOS ... OPTIONAL TOP-
MOUNTED POWER TAKE-OFF ...
LOW INITIAL COST, LESS MAINTENANCE ... AVAILABLE FROM ALL
LEADING TRUCK MANUFACTURERS
ON SPECIFICATION**



Specify

Specify the MODEL

*Choose from 16 Models of
FULLER Three-Speed Auxiliaries*

**FULLER TRANSMISSION
DIVISION
EATON MANUFACTURING COMPANY
KALAMAZOO, MICHIGAN**

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People in the News

continued from page 41



Alpha Portland promotes Heineck & Cosgrove

Dale W. Heineck (left), formerly assistant manager of the LaSalle, Ill., plant of Alpha Portland Cement Co., Easton, Pa., has been promoted to manager of the company's new plant at Lime Kiln, Md. He succeeds George V. Cosgrove (right) who has been made manager of process engineering at Easton.



Mr. Heineck joined the LaSalle plant in 1954 and one year later became assistant plant manager.

Mr. Cosgrove has been with Alpha since 1957 as plant engineer at the Manheim, W. Va., plant. He served later as combustion engineer for all plants prior to being appointed manager of the Lime Kiln plant.

Hawaiian Cement elects president and chairman

Walter C. Russell, president of American Cement Corp., has been named president and chief executive officer of Hawaiian Cement Corp., Honolulu, Hawaii, and Robert D. Fisher has been elected chairman of the board.

Mr. Russell will continue as president of American Cement Corp., dividing his time between Detroit and Honolulu. Before becoming president of American Cement in 1959, Mr. Russell was for 25 years president of Peerless Cement Co., one of the companies that merged to make up American Cement Corp.

Mr. Fisher becomes board chairman upon the resignation of Garner A. Beckett of American Cement Corp., who continues as a member of the board. Mr. Fisher has been president of Hawaiian Cement Corp. since its or-

ganization in April 1959, and is vice president of Cyprus Mines Corp., a major stockholder in Hawaiian Cement Corp.

Howard R. Starke continues as executive vice president and general manager of Hawaiian Cement Corp.

Victor Portland Cement appoints sales director

Louis J. Thompson has been promoted from assistant sales director to sales director of the Victor Portland Cement Division of General Portland Cement Co., Fredonia, Kan. A native of Kansas and a graduate of Kansas University, Mr. Thompson joined the Victor Division in 1958. He was appointed assistant sales director in 1960.

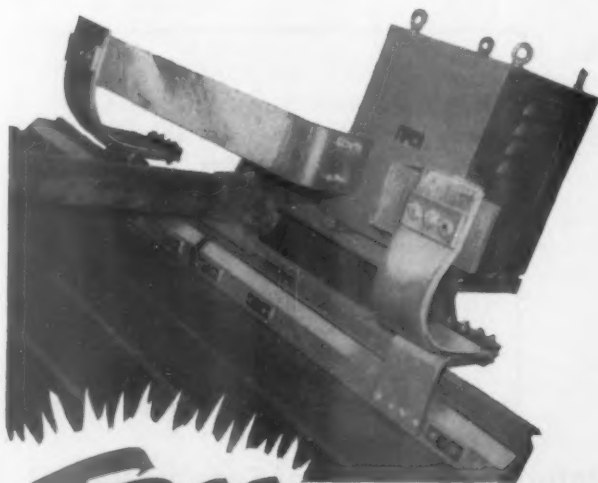
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**BLINDING ROBS YOU
OF PROFITS** *every day that
screens go unheated...*

ask any user to confirm the* **FACTS**
CONVERTA-SCREEN

→ has the simplest, surest construction
→ the lowest power consumption
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HEAT ANY SCREEN . . . ANY DECK with proven equipment. Tell us what vibrating screens you have and we will show you a modern custom-built CONVERTA SCREEN installation to increase production and cut operating costs.

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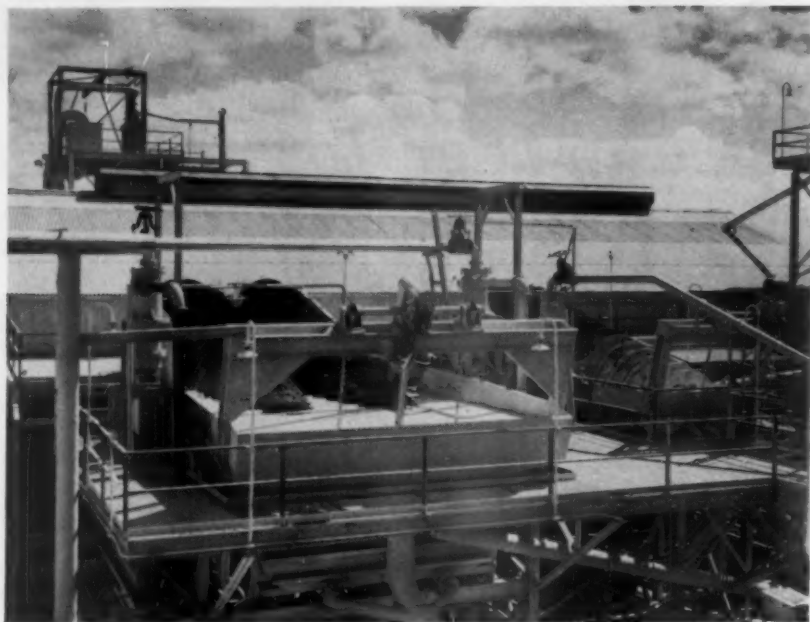
**names on request for your locality*



AGELESS AKINS

1934 Akins Simplex Classifier still giving Dependable Performance for Virginia-Carolina Chemical Corp.

The 78" Akins Simplex Classifier, built in 1934, is dewatering coarse feed in a special flotation circuit. The new 72" Akins Duplex Classifier, with flared tank and serrated shoes, is dewatering and desliming flotation feed. Photo shows three of more than 200 Massco-Grigsby Pinch Valves purchased by Virginia-Carolina Chemical Corporation.



Working Beside New Akins Duplex

The 78" Akins Simplex Classifier, built in 1934 for a large mining company, was acquired by Virginia-Carolina Chemical Corporation in 1956. Based on its dependable and efficient operation the company purchased a 72" Akins Duplex Classifier and a 60" Akins Simplex Classifier for its Clear Springs phosphate plant in Florida. These classifiers were sold and serviced by Mine and Smelter's Sales Agent, R. H. Clark Equipment Co., Inc., Mulberry, Florida.

"Ageless" Akins Classifiers, for washing, desliming, dewatering, size separation, and closed-circuit grinding, are available in sizes from 12" to 84" spiral diameter, simplex and duplex, with standard or submerged spiral. Sand raking capacities up to 7860 tons per 24 hours; overflow capacities up to 2386 tons per 24 hours.

For complete information write for Catalog No. 601

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People in the News

continued from page 42

Warren Fish retires

Warren D. Fish, chief of the Construction Administration Branch, Construction & Maintenance Div., Bureau of Public Roads, has retired after 27 years of service. Before joining the Bureau in 1934, Mr. Fish was with the South Dakota Department of Highways and the Missouri State Highway Commission.

Born in Tyndall, S.D., Mr. Fish graduated from South Dakota State College with a BS degree in civil engineering. He joined the Bureau in Division 2 office, which is now Region 2 office, where he handled various phases of the work involving design, construction, maintenance, right-of-way and secondary roads. In 1953, he was named chief of the Specifications, Standard Plans & Materials Section, and in 1954 became Chief of the Construction Administration Branch.

Penn-Dixie elects new president

Fred L. Doolittle has been elected president and chief executive officer of Penn-Dixie Cement Corp., New York, N.Y. He succeeds B. W. Druckenmiller, who has been named chairman of the board.

Mr. Doolittle, a native of Massachusetts, has been executive vice president and a director of Penn-Dixie for the past five years. He joined the Boston sales office in 1929 and was made assistant sales manager in 1941 at the company's New York office. He became general sales manager in 1945, and executive vice president and director in 1956.

Mr. Druckenmiller, who has been president since 1945, joined the company in 1929. A director of the Portland Cement Association, he has been active in the cement industry since 1913.

OBITUARIES



Oscar E. Benson, president of The General Crushed Stone Co., Easton, Pa., died suddenly on April 6 while he and Julian Parton were on a visit to the Glen Mills, Pa., plant. He was 62 years old.

Mr. Benson had been president of the General Crushed Stone Co. since 1951. He joined the company in June 1947 as assistant to the president and in September of that year was elected vice president.

Prior to his association with General Crushed Stone Co., Mr. Benson was manager of the Easton division of the Metropolitan Edison Co. from 1942 to 1946, when he was named vice president and placed in charge of the York division.

An active member of the National Crushed Stone Association Mr. Benson was elected president in 1958 after serving a year as executive vice president. He had been a director of the association since 1955.

Louis Vasalotti, founder and president-treasurer of the Riverside Sand and Gravel Co., Inc., Newton Lower Falls, Mass., died March 13. He was 85 years of age. Mr. Vassalotti founded the firm in 1922.

END

ROCK PRODUCTS, June, 1961



AUTOMATED Hydral-60 PINCH VALVE SYSTEMS

Controlled circuitry
for any operating
requirements

- The Massco-Grigsby Hydral-60 System consists of one or more pinch valves with a single automatically operated hydraulic pump.
- Hydraulic pump may be operated by electric motor or by air from normal plant supply system.
- Valves may be the same or different size.
- Valves in the system may be operated simultaneously or independently.
- Control valve may be manual or solenoid.
- Valves may be coordinated and interlocked with other plant equipment to automatically control tank levels, rate of flow, etc.
- Valves are self-supporting and may be operated in any position from horizontal to vertical.
- Valves may be independently controlled for normal or rapid closure.
- Valves may be held fully open, fully closed, or at intermediate positions.
- Remote control to meet individual requirements.
- Controls may be included for automatic emergency operation.
- 3" to 14" I.D. sizes, with 50, 100, and 150 psi line pressure ratings.
- Temperatures to 200° F.

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CATALOG NO. 609
Manufacturing Division

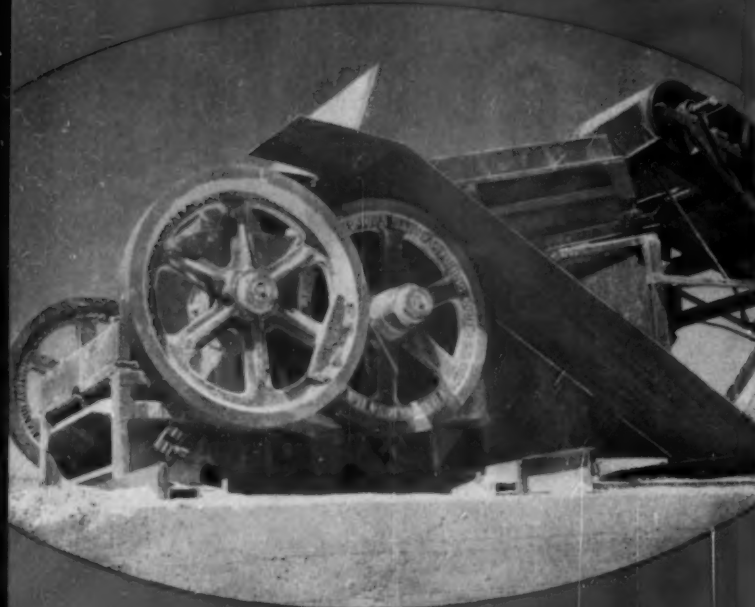


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OFFICES AND AGENTS IN PRINCIPAL CITIES

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CEDARAPIDS TWIN JAW CRUSHER SETS THE PACE FOR 200 TON PER HOUR PLANT



Harper Jackson Sand & Gravel Co., of Salt Lake City, utilizes the extra capacity of their Cedarapids 12" x 36" Twin Jaw primary to maintain 200 ton per hour production of minus 1" road base material. The plant also includes a Cedarapids 4' x 12' horizontal vibrating screen and two Cedarapids 22" x 35" roll crushers.

Extra Output—Extra Profit—For Your Plant

In addition to 40% to 100% higher crushing capacity over single jaw crushers, Twin Jaw crusher owners get these other benefits which reduce maintenance costs while improving performance:

- Eccentric shafts extra heavy to absorb strain and minimize shaft flexure • Adjustable-tension timing chain drive prevents trouble due to possible shaft flexure • Heavier than average self-aligning pitman and side bearings to absorb side thrust • Reinforced, electric-welded crusher bases completely stress-relieved for longer life • Extra heavy flywheels insure smooth operation under surge feeding with minimum power.

Get complete details from your nearby Cedarapids Dealer.

Engineered for lowest cost per ton

Cedarapids

MADE IN
IOWA

561 2/3N

**IOWA MANUFACTURING
COMPANY**
CEDAR RAPIDS, IOWA

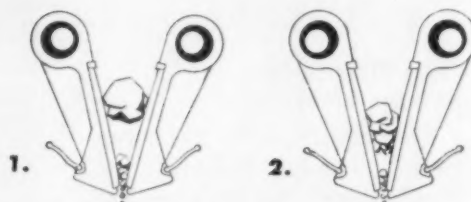
What you should know about

Increased Primary Crushing Capacity

How you increase primary crushing capacity to step up plant production and profits depends upon conditions in your pit or quarry. If you are handling large, hard or abrasive quarry rock, or have a high percent of oversize in the pit, a Cedarapids Twin Jaw crusher can be the most profitable primary crusher you can use.

What Is A Twin Jaw Crusher?

This is the unit which increases primary crushing capacity 40% to 100% over a single jaw crusher of comparable size. It combines Cedarapids-engineered overhead eccentric design with the principle of two movable jaws operating on two synchronized counter-rotating shafts which swing the jaws inward and downward at high speed, force-feeding the material into the crushing chamber and imparting a high impact velocity to the jaws for crushing without abrasive rubbing.



Drawing 1, maximum opening at top of chamber. Bottoms of jaws begin to close for secondary crushing action.

Drawing 2, top of chamber at minimum opening. Simultaneously, discharge opening widens for fast discharge.

This is the design which has been *thoroughly proved for 15 years* in hundreds of stationary and portable plant operations. You can be sure, from its past performance, a Cedarapids Twin Jaw will deliver the high-capacity, low-cost output you want, with no "bugs" to be worked out by you.

Why A Twin Jaw Produces More

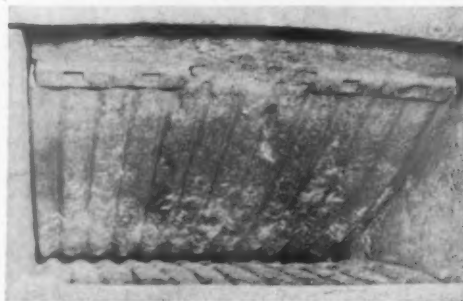
The Cedarapids Twin Jaw crusher can be fed faster, crushes faster, and discharges faster than a single jaw of the same size to often double hourly tonnages. In the primary operation, the Twin Jaw fractures a greater percent of rock, much of it crushed to finished size, thus reducing the circulating load and saving wear on the secondary crushers. The roll crushers in your plant will be more efficient, not only because the Twin Jaw does some of their

Enter 1224 on Reader Card

work, but also because you can operate the primary crusher with the discharge opening reduced to obtain smaller size feed for the secondaries.

Handles Many Types Of Materials With Very Low Maintenance Costs

With a versatile Cedarapids Twin Jaw crusher in your installation, either as a primary or intermediate unit, you can profitably handle hard abrasive rock. The high speed operation imparts a high impact velocity to both jaws to shatter hard material more readily and to fracture the rock without abrasive rubbing. This live action on all areas of both jaw faces, with rubbing under pressure held to the minimum, materially reduces manganese wear. Jaw life on a Twin Jaw crusher has proved to be 5 to 8 times longer than on a single jaw crusher. Your savings on turning, building up and replacing jaws will greatly add to the net profit of your plant.



Over 900,000 tons of gravel had gone through these twin jaws when the photo was taken. The jaws were turned after 525,000 tons had been crushed, and as shown, the ribs still protrude to indicate plenty of additional wear.

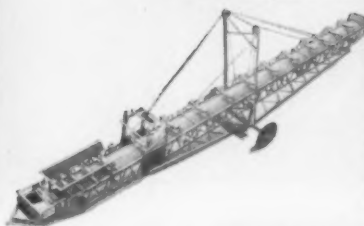
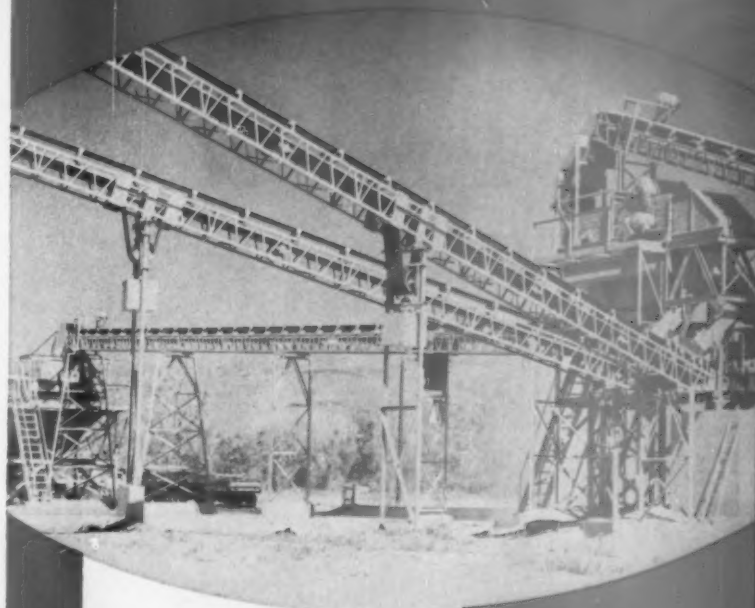
Will Your Conveyor System Handle Increased Plant Capacity?

Increasing primary capacity and plant output requires a conveyor system built to move the higher tonnages at lowest possible cost per ton. Cedarapids Strigid Conveyors meet this requirement perfectly. Strong, rigid construction has the structural strength and stability to handle the heavy loads without weaving or buckling, or swaying in high winds. Additional modular components, pre-fit for perfect alignment, can be ordered "off the shelf" for immediate delivery. You can alter or extend your conveyor system in the field to meet changing requirements without delays for special engineering and at minimum cost.

Cedarapids Stationary Plant Engineers are always at your service to engineer your new installation from primary crusher to delivery conveyors, or to help you modernize your present plant to increase production and reduce your cost per ton.

Enter 1224 on Reader Card

CEDARAPIDS STRIGID CONVEYORS MOVE MORE TONS AT LOWER COST



Portable lattice frame conveyors are engineered with the same strong, rigid design as Strigid stationary conveyors. Cable method of erection saves on maintenance.

Designed for extra strength and rigidity— Pre-engineered to cut installation costs

Rugged truss design with diagonal angle-steel side bracing the full depth of the truss, rigid frame and joint construction, and lateral cross bracing between side members are among the many new-design features that give Strigid Conveyors extra strength and rigidity without extra weight.

Standardized, interchangeable components are pre-engineered at the factory for fast, easy, low-cost field erection. There's no cost or delay for special engineering, special drawings or calculations. Modular components ordered "off the shelf" meet your exact requirements; additional modular units are immediately available from stock for quick field alterations.

Call your Cedarapids Dealer for a quick quotation and prompt delivery.

Engineered for lowest cost per ton

Cedarapids
Cedar Rapids, Iowa

661 2/3H

**IOWA MANUFACTURING
COMPANY**
CEDAR RAPIDS, IOWA

INDUSTRY NEWS



Gypsum fleet totals five

The fifth in the U. S. Gypsum Co.'s fleet of self-unloading ships, the S. S. Gypsum Countess, arrived recently in Jacksonville, Fla. On her maiden voyage from Nova Scotia the Countess carried approximately 11,000 tons of gypsum rock—enough for 12 million sq. ft. of wallboard.

The unusually swift unloading operation requires no manual aid, as the rock is whisked to shore at a rate above 1,000 tph. A boom conveyor, riding with the ship's roll, is extended to the ship. Two rows of gates inside the hull control the rock feed from the twin-troughed cargo area onto two parallel conveyors, which then carry the rock to a cross belt at the stern of the

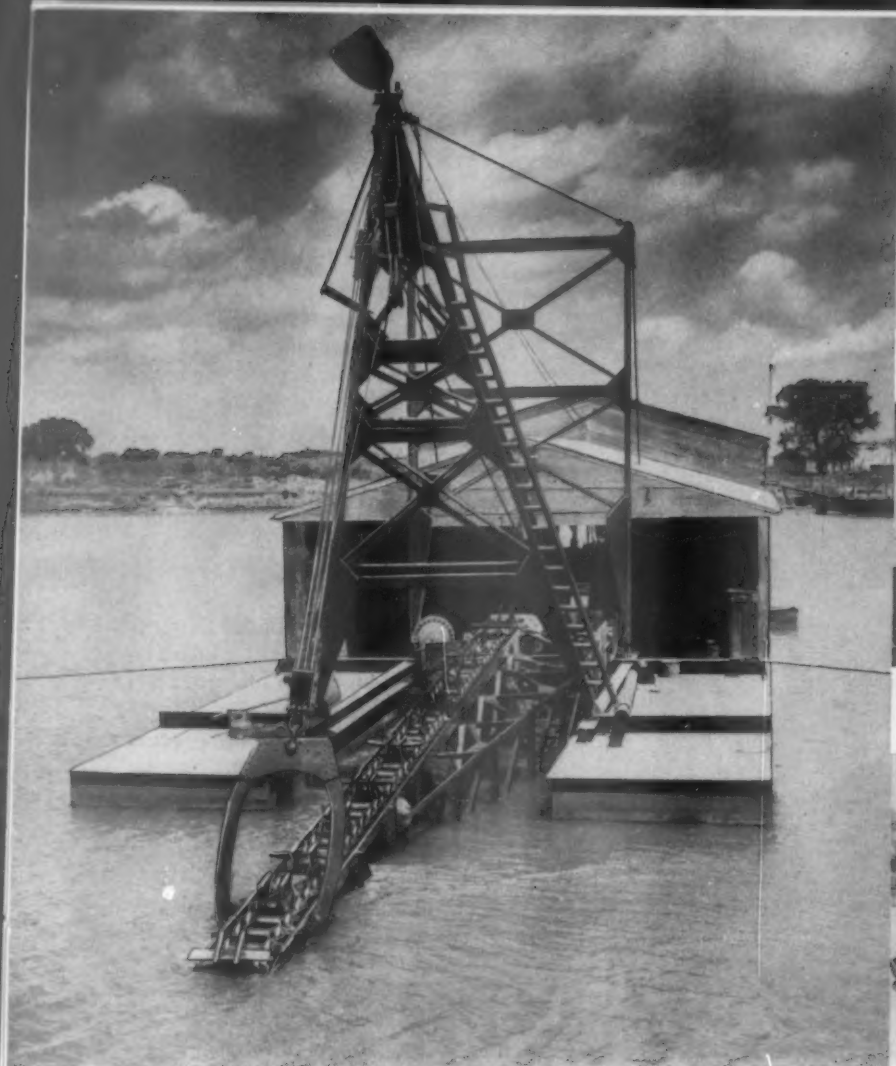
ship. This 32-in. electrically interlocked belt carries the raw material to a large shed, where it is evenly stockpiled. As a fine indication of the Jacksonville area's building boom, the Countess and her four sister ships are scheduled to bring in about 50 loads this year.

Turkey may be fine source of fluorspar

Utica Mines, Ltd., Vancouver, B.C., is exploring for fluorspar near Akdagmeydani in Eastern Anatolia, Turkey. The company claims it is willing to invest up to \$100 million in Turkish mineral development.

Please turn to page 50





Cutter bars on the traveling chain of the "Swintek" actually carry nozzle clogging oversize material up the ladder and dump them away from the suction zone.



Eagle Revolving Cutter Head Dredging Ladders recommended for dredging in hard or sticky material which does not cave or disintegrate freely. Ask for Bulletin 156. Eagle also builds complete All-Steel dredges.



users report

BIG INCREASE

in production with an
Eagle "Swintek" Dredging Ladder!

A New Jersey operator even reported as much as 400% increase in output—A Kansas producer with three "Swintek" equipped dredges as much as 300%. No producer that has installed an Eagle "Swintek" ever failed to achieve a worthwhile increase in production—much more than enough to justify the cost. The traveling chain of the "Swintek" screens the intake nozzle keeping out boulders and logs—eliminates shut-downs because of clogged

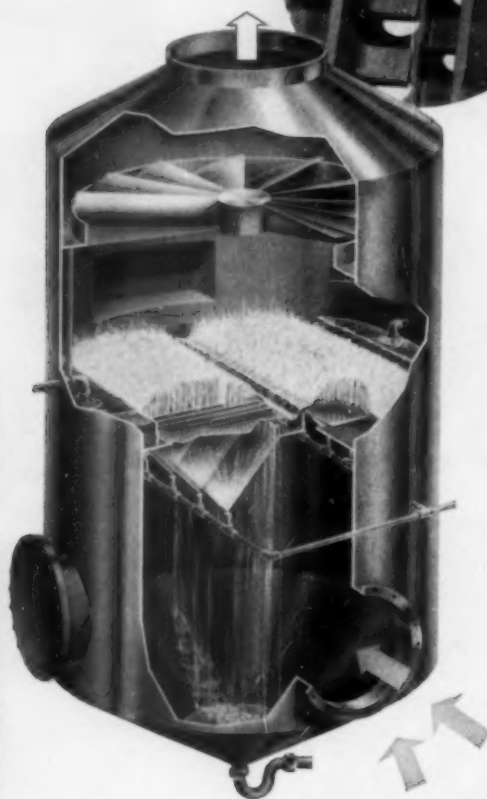
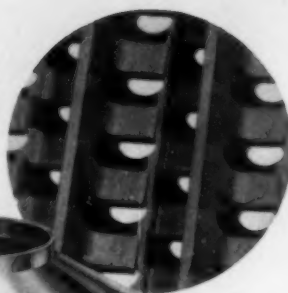
lines—protects pump. Cutter bars on the traveling chain agitate the deposit greatly increasing intake of solids—also cut through stratas of clay that ordinary suction cannot penetrate—promotes continual bank caving, relieving dangerous problem of deep under cutting. A size and type for every condition—river or pond dredging. When your pit gets below the water table and you convert to pumping keep the "Swintek" in mind. Send for Catalog 83.



EAGLE IRON WORKS
ENGINEERS • MANUFACTURERS

137 Holcomb Ave., Des Moines, Iowa

Jet-swirl action. Gas, drawn upward through perforated plate, is divided into thousands of jets. Each strikes the wetted impingement surface directly above, bounding and rebounding against various grid surfaces. The turbulent intermixture of gas pressure and liquid causes complete saturation.



IMPINJET™ SCRUBBER

High Efficiency... Low Operating Costs

Now Sly brings you the simplest, most effective wet cleaning method known. The new IMPINJET Gas Scrubber assures thorough saturation of particles, even in sub-micron sizes.

There are no moving parts. Complete cleaning results from the turbulent interaction of gas and liquid, as effected by the impingement baffle plate.

Pressure drop and resulting power requirements are low. Liquid consumption is only 1 to 3 gallons per 1000 CFM at 20-40 psig.

The IMPINJET Scrubber utilizes the proven principles contained in the original Harmon patents basic in the development of the impingement plate scrubber. Single-plate units effectively clean gases resulting from a wide variety of industrial processes. Multi-plate units are available for absorption, cooling and extra-high-efficiency applications.

For dust suppression, wet or dry, consult Sly — maker of the Dynaclone, the self-cleaning, continuously operating dry dust filter.

Send For New IMPINJET Catalog



THE W. W. SLY MANUFACTURING CO.

4746 TRAIN AVENUE • CLEVELAND 1, OHIO • OFFICES IN PRINCIPAL CITIES
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Industry News

continued from page 48

Missouri crushed stone men balk at "unfair" tax

A recent editorial in the Missouri Limestone News blasts tax proposals pending before both houses of the state legislature. Bill SB-239 provides for a severance tax on all materials mined in the state of Missouri. The worst offender, HB-365, would levy a mill tax on tonnage produced providing for safety inspection under the Division of Mine Inspection.

If the latter bill goes through, the writer predicts it will be the "death blow to much of Missouri's mining industry that is either barely breaking even or losing money at the present time." Incoming industry would be discouraged at the start; besides, according to the writer, the quarries are already receiving competent safety inspection services by registered professional engineers.

Colorado is cited as a state in which it has been found that taxes set up to milk easy money from an industry only depress the basic mining and quarrying industries.

Please turn to page 56

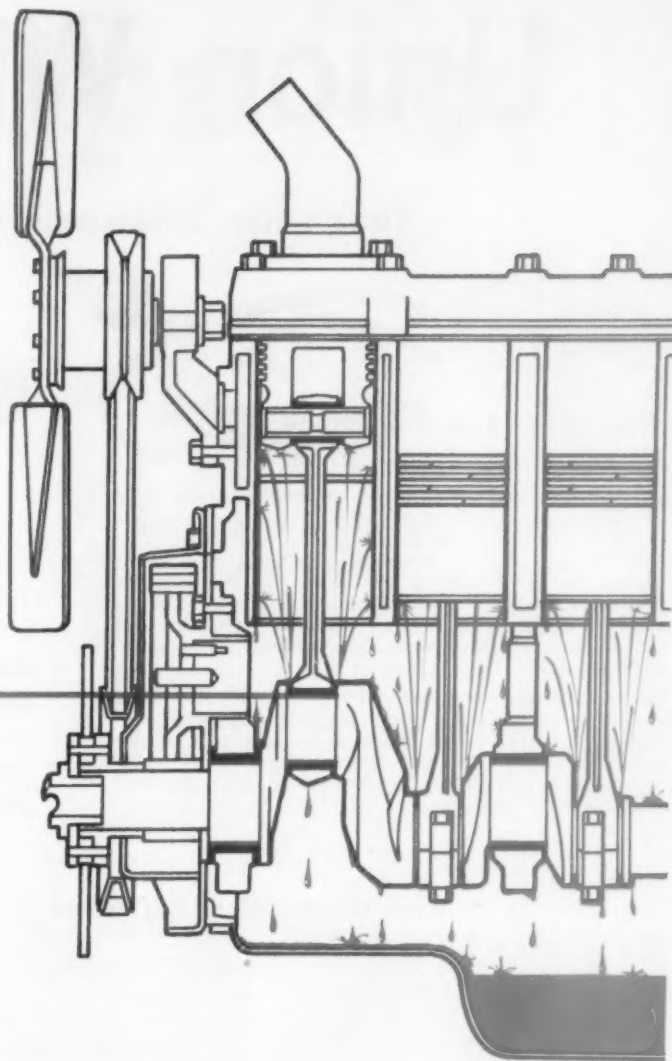
NOTICE

**Rock Products subscribers,
Concrete Products subscribers,
and prospective subscribers**

We have been informed that a Mr. Thomas Kelly has been representing himself illegally as being affiliated with Rock Products or Concrete Products magazines. It is also believed that he may have used the name of Tom Ryan. We've had reports that he sells subscriptions to both magazines.

In the knowledge of the present publisher, this Mr. Kelly is not now, nor never has been, associated with Rock Products magazine or any of its affiliated publications. Under no circumstances should he be given cash or a check for a subscription. If he presents himself as a representative of either magazine, please call us collect immediately at RAndolph 6-2802 in Chicago, Illinois

Why precision bearings are vital here



Engine bearings have *two* vital jobs. They provide a low-friction surface for journals to ride on. But equally important, they control the oil throw-off, due to the spinning action of the shaft, that lubricates and cools cylinder walls and other engine parts.

Exact tolerances are needed in engine bearings and shaft diameters to get the kind of precise "clearances" needed to control oil throw-off. *Too little clearance*—an error of less than .001"—may result in an overheated bearing and early bearing failure due to insufficient lubrication.

Too much oil clearance is equally harmful to proper engine performance. If oil clearance is changed from

just .0015" to .006", the oil throw-off (shown above) increases 25 times. And even the best piston rings can control only about a 5 times normal amount of oil. The excess oil then slips past piston rings into the combustion chamber where it clogs piston rings and builds up combustion chamber deposits.

Federal-Mogul knows, as you probably do, the importance of oil clearances. That's why **Fm** bearings are manufactured to tolerances as close as $\pm .000125"$ —1/16 the thickness of a human hair. Why take a chance on anything less than precision engine bearings? You can be sure of a satisfied customer when you use the best. See your Federal-Mogul jobber.



FEDERAL-MOGUL ENGINE BEARINGS

FEDERAL-MOGUL SERVICE

DIVISION OF FEDERAL-MOGUL-BOWER BEARINGS, INC. • DETROIT 13, MICHIGAN

Union Wire Rope

Tough-job "champs"--Union Wire Ropes and Slings



"Real Gone" from Beatings on the Drum

Even under normal operating conditions, drum wear gives wire rope severe punishment. This wear concentrates at the cross-over points and at the flange. Excessive drum crushing results from operating on small drums, excessive loading and poor winding. Smooth drums are not recommended. Here are typical "drum beatings"; cross-over wear; cross-over crushing on drum; drum crushing from poor winding; drum-crushing from small drum.

Although drum wear cannot be eliminated, its effects can be greatly reduced. Under properly engineered procedures, two and three times the service can be obtained from the same line by improving drum conditions. Union Wire Rope Engineers will help you with this problem.



On the "Blink" from a Kink



This open kink resulted from mishandling of rope. Guard against kinks by proper winding on the drum. Never pull a loop smaller. Always enlarge it, then straighten out the rope.

Each Union Tuffy is Engineered to Meet a Different Tough Job



Tuffy Scraper Rope

Flexible enough to take sharp bends; stiff enough to resist looping and kinking when slack; highly resistant to the shock of load impact—that's Tuffy balanced construction. Mount a reel on your scraper—save wasting sound rope.



Tuffy Slings and Hoist Lines

Slings are a patented, 9-part machine-braided wire fabric that is next to impossible to knot or kink. Hoist lines have built-in strength, toughness, flexibility. Balanced—a top-performing team for handling every type of material. In addition to Tuffy, Union Wire Rope furnishes a complete line of slings.



Tuffy Dozer Rope

Mounts right on your dozer in a 150' reel. When rope shows wear, just feed through enough to replace the damaged part. Saves rope, gives you a bonus of extra service. Also available in 300' and 500' reels.

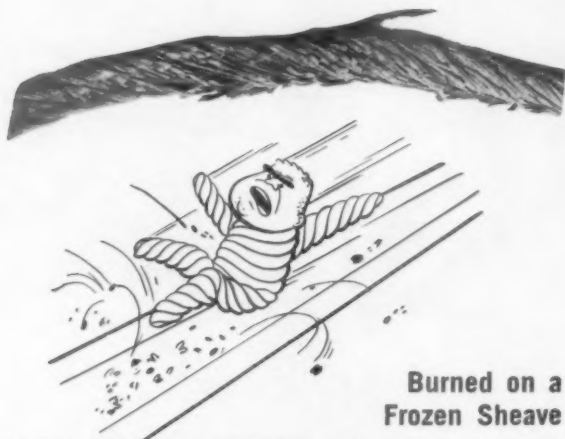


Look to the Union Wire Rope Organization for "Right Rope" Service. Union has more than 1600 standard constructions, *plus* the special Tuffy family of wire ropes and slings tailored to exacting special needs. For many years people with special wire rope needs have been coming to Union for help. That's the way the Tuffy family grows. Our research laboratory is at your service. If we don't already have it, we'll design and fabricate just the rope or sling you need. And you'll be sure of Union strength, Union flexibility, Union job-tested quality. Call your Union distributor—see the phone book Yellow Pages.

Tuffy Tips

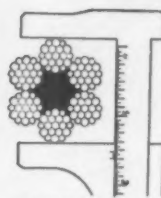
New steels are
born at
Armco

keep the title longer with proper handling.

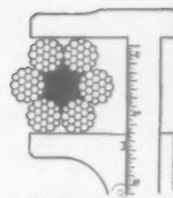


**Burned on a
Frozen Sheave**

End of the line came quickly for this rope as the result of operating over a sheave that did not turn. Note the exceptionally heavy abrasion on one side of the rope. Sheaves should be checked thoroughly and often.



Right Way



Wrong Way

How to Measure Rope Diameter

To get the most service, efficiency and safety out of wire rope operation, rope and sheaves must be precisely fitted to each other. There's only one right way to measure rope diameter: use machinist's calipers and be sure to measure the *widest* diameter.

A slight shift of the rope in the calipers, as shown above, will give you a misreading which would result in ordering an undersize rope. Note that the measurement at right shows $\frac{1}{8}$ " under correct diameter. Be sure to double-check every time!



Tuffy Dragline Rope

High abrasive resistance and super flexibility. Gives long service, dependable action in handling any material—wet or dry dirt, sand, gravel, rock, minerals. Rides smoothly on grooves—hugs the drum when casting for full load.

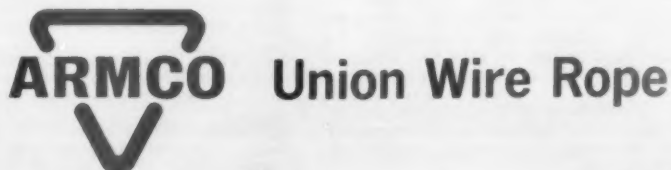


Union Wire Rope Handbook of TUFFY TIPS...Free!

The "Tuffy Tips" shown here are quoted right out of Union's handbook. In it there are dozens of other priceless hints on the correct use of wire rope. The common abuses and how to avoid them. How to save costly injuries. Maintenance tips. The proper fittings and how to apply them. Recommended sizes. Many other facts and suggestions that will cut down your rope costs and help you get out of wire rope the full service we build into it. No charge. Write Union Wire Rope, Armco Steel Corporation, 2156 Manchester Ave., Kansas City 26, Missouri.

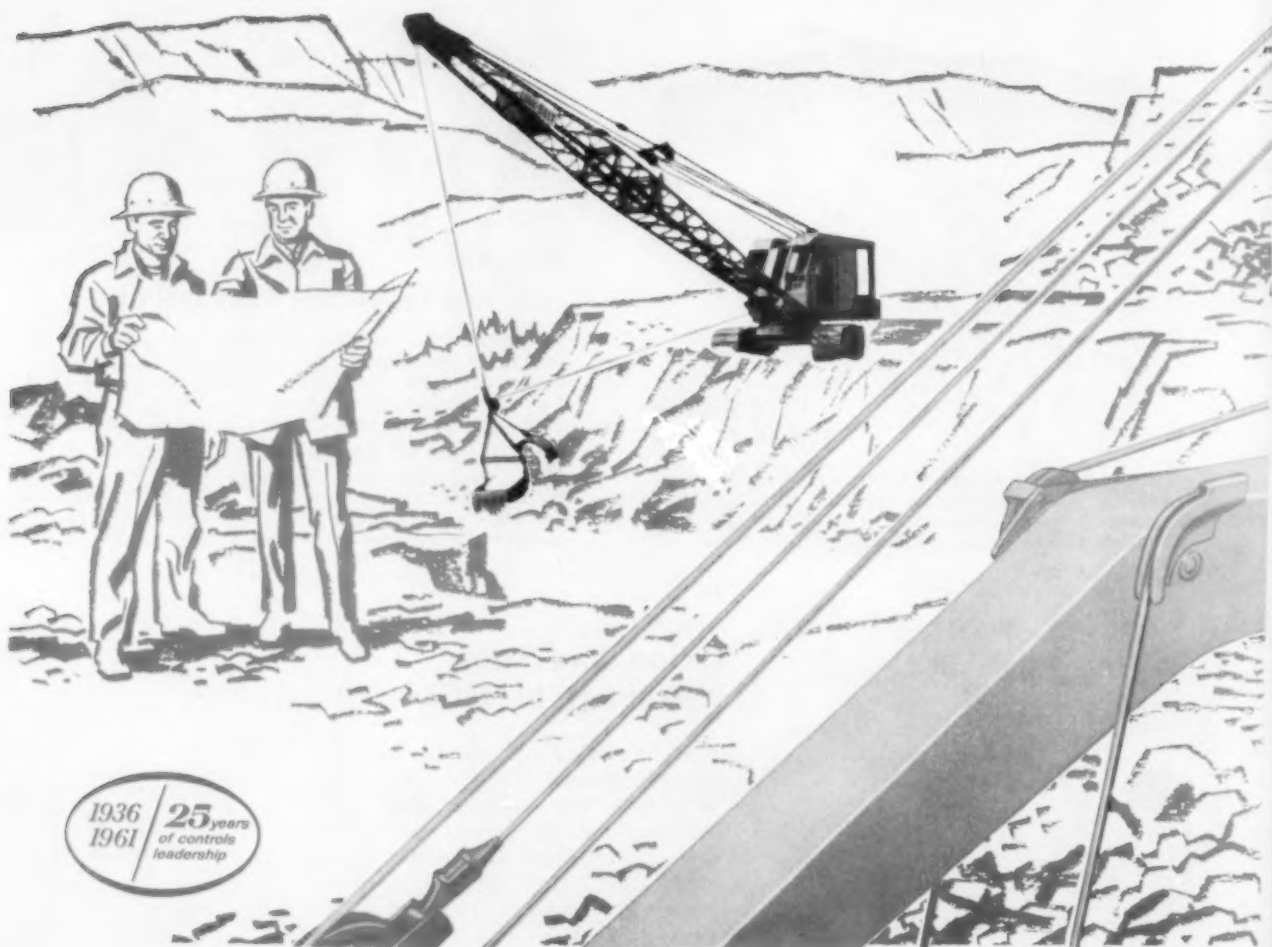


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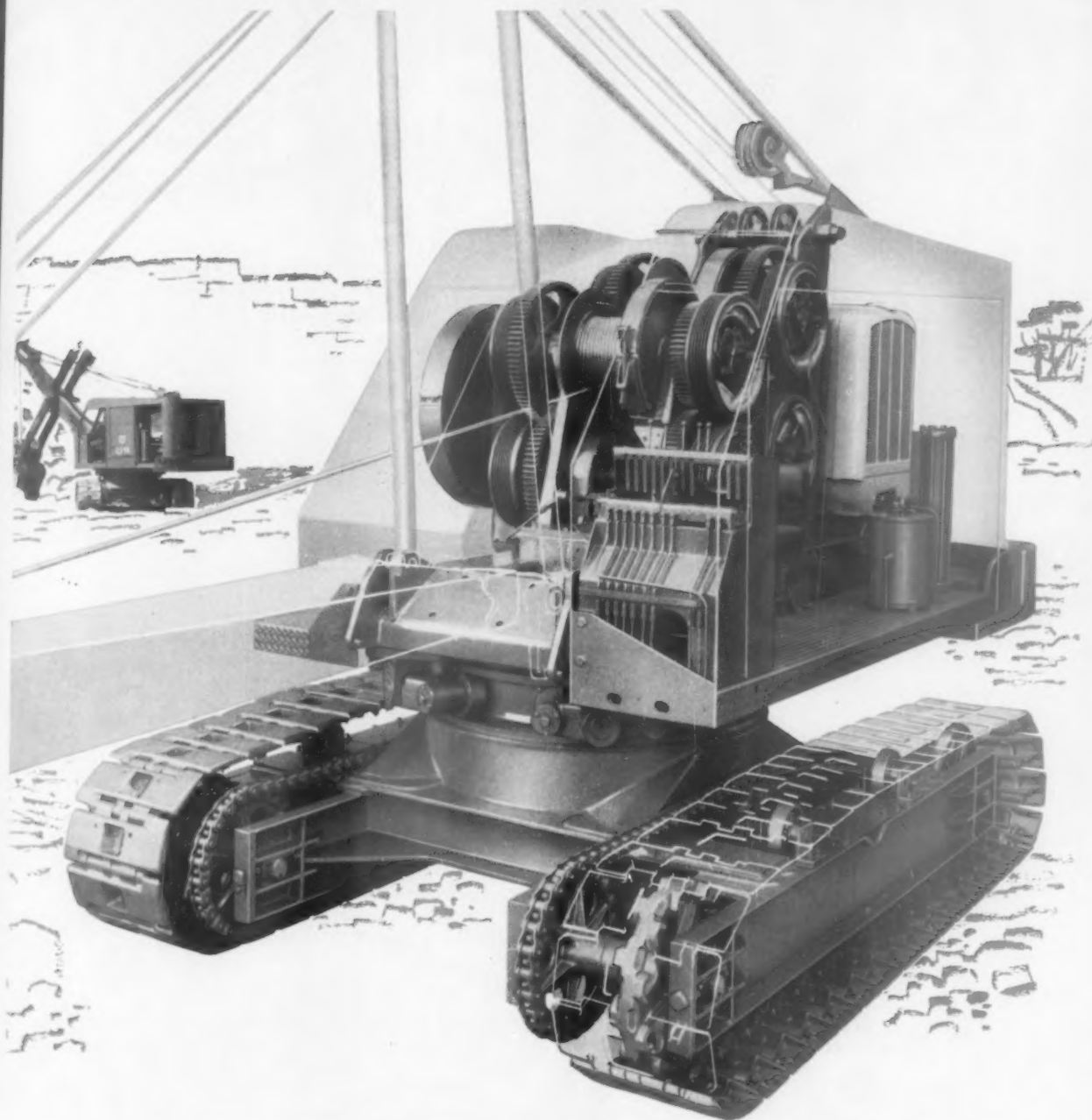


X-RAY VIEW REVEALS

10 LINK-BELT design features that reduce your downtime...cut your costs



- ① **Full-Function Design** practically doubles upper machinery life. Separate shafts...separate gears...separate clutches transmit power for *each* machine function. Only the components in actual use are under load...other shafts and clutches remain motionless while gears run free on anti-friction bearings. Full-Function Design has been proved in the field year after year to be superior to conventional design.
- ② **Speed-o-Matic power-hydraulic controls** reduce downtime! In addition to eliminating up to 150 mechanical parts, the Speed-o-Matic system is unaffected by normal changes in climate or temperature. Only a seasonal oil change is required...no need to prime or bleed the system.
- ③ **Speed-o-Matic clutches** require little operator attention! Hydraulic cylinder pistons automatically compensate for normal lining wear, heat expansion or weather changes. Minor adjustments may be weeks, even months apart.
- ④ **Clutches are interchangeable** on a given machine (including components of each) for reduced parts inventory. Located *outside* the side housings, clutches are readily accessible...can be easily pulled.
- ⑤ **Extremely short drum shafts** minimize bending and flex! Tandem drum arrangement allows closer spacing of the side housings and the side housing bearings, resulting in more rigid supports.
- ⑥ **Fast, simple removal of any operating shaft!** Brake drums, clutch spiders and bevel gears are involute-splined to the shafts...no press fits or keyways used.
- ⑦ **No heat transfer between clutch drums and brake drums!** Clutch drums are separated from gears and brake drums to minimize clutch and brake wear.
- ⑧ **Long-life mechanical drum brakes** are easier to operate and service! Unlike brakes on some shovel-cranes, all moving parts are mounted on antifriction bearings to reduce wear.
- ⑨ **Lower machinery fully protected** against dirt and other foreign material! Hydraulic power steering and automatic brakes are completely enclosed in a clean, flat carbody.
- ⑩ **Adjustable, conical hook rollers** follow a true circular path...no scuffing or peening. Double flange turntable eliminates center pivot up-pull or wear-causing bind or stress.



NOTE: The entire upper machinery of the Full-Function Design models (8- to 40 ton capacity) can be field-stripped, piece by piece, without removing major portions of the cab. For fully-illustrated, descriptive literature on the various models in the Link-Belt Speeder line, see your distributor. Or write: Link-Belt Speeder Corporation, Cedar Rapids, Iowa.

117-61N

LINK-BELT SPEEDER



21 crawlers



7 truck-cranes



3 self-propelled





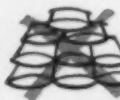
It's time to compare . . . with Link-Belt Speeder

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ROCK PRODUCTS, June, 1961

8 REASONS

A Marietta SILO SYSTEM CUTS BULK STORAGE COSTS...

- 1** Built for safer, better bulk materials protection.
- 2** Engineered to operate with any materials handling system.
- 3** Designed to meet precise requirements.
- 4** Space saver that consolidates materials, minimizes space needs.
- 5** 12 types of gravity discharge systems to meet any need.
- 6**  Eliminates ground storage losses.
- 7**  Cuts handling costs.
- 8**  Eliminates expensive bagging.

For complete information on how a Marietta Industrial Silo System can be engineered to meet your exact requirements and help you to cut costs, speed handling and protect materials, write for our Industrial Storage Systems Catalog.



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Industry News

continued from page 50

Phoenix corporation takes on three more outfits

Recently-formed United Materials, Inc., Phoenix, Ariz. (see ROCK PRODUCTS, March 1961, p. 52), has purchased three additional operations, giving it complete coverage of the metropolitan area, as well as much of the territory between Phoenix and Tucson. The companies are: Buckeye Sand & Gravel, Buckeye; Apache Junction Ready-Mix, Apache Junction, and Kalkina Ready-Mix, Casa Grande.

Proxy deceptions lead to fines, sentences for Popes

In February, Anthony Pope, president of Colonial Sand & Gravel Co., Inc., New York, and his brother Fortune, executive vice president of the firm, changed their plea from innocent to guilty of charges that they had diverted over \$375,000 from the company and its stockholders for the benefit of other, wholly owned businesses. The Popes own 66 percent of Colonial Sand & Gravel, which was originally entirely owned by the family.

After trial, Judge Edward Weinfeld fined the brothers \$25,000 each and suspended one-year jail sentences, run consecutively on five counts, for violating Securities & Exchange regulations involving deceptive proxy data. Actually, the Popes had used company trucks in secret to transport rock salt for the city's snow removal program. They were not sentenced on five additional counts, which charged them with filing false statements with the American Stock Exchange. Defense brought out that they had paid back over \$400,000 to Colonial before the indictments last July.

Commenting on the case, Assistant U. S. Attorney Robert B. Fiske claimed that the plea of

guilty marked "the first conviction ever obtained in a Federal Court involving evidence of a criminal conspiracy in the undisclosed diversion of corporate funds."

Later, in answer to questions posed by shareholders at the annual meeting, Anthony Pope claimed that to avoid future conflicts of interests he and his brother plan either to consolidate into Colonial Sand & Gravel two of their other companies (Empire Sand & Stone Corp. and Colonial Blue Diamond Mortar Corp.), which do business with Colonial, or divest themselves of holdings in these two firms.

More companies report 1960 profit setback

Even though in some cases greater sales were realized, companies are continuing to report a dip in net income for last year. Some representative figures:

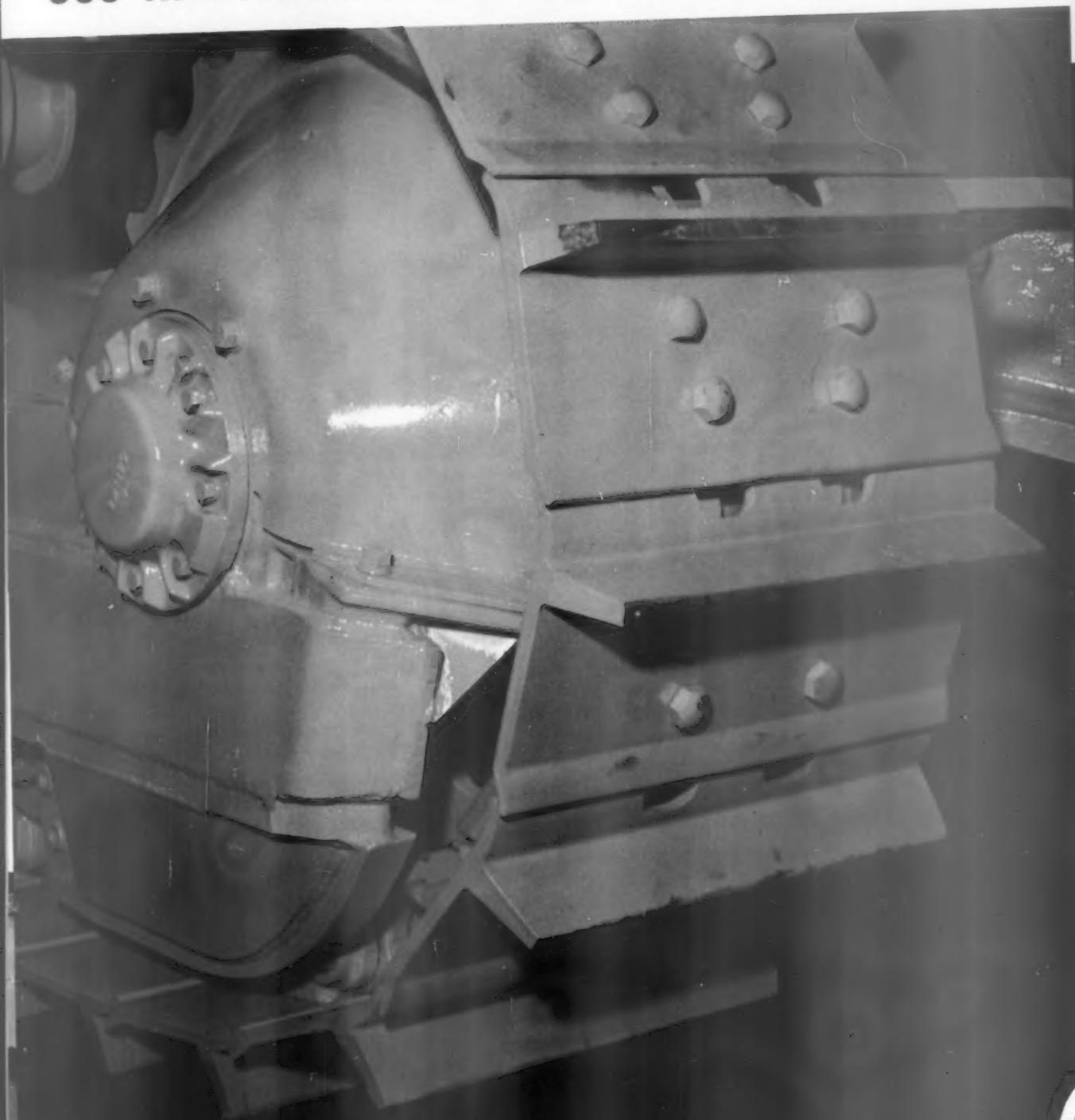
	1960	1959
National Gypsum Co.	\$23,492,998	\$25,561,679
The Flintkote Co.	12,963,627	15,068,418
Lehigh Cement Co.	7,739,409	9,430,946
Canada Cement Co. Ltd.	6,205,159	7,011,305
Vulcan Materials Co.	5,926,000	6,191,000
Medusa Portland Cement Co.	3,725,000	4,105,000
American Agricultural Chemical Co.	3,550,522	5,063,169
Giant Portland Cement Co.	2,819,278	3,410,778

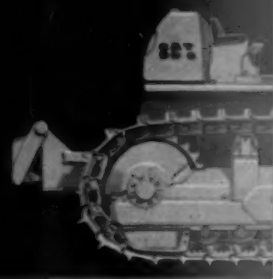
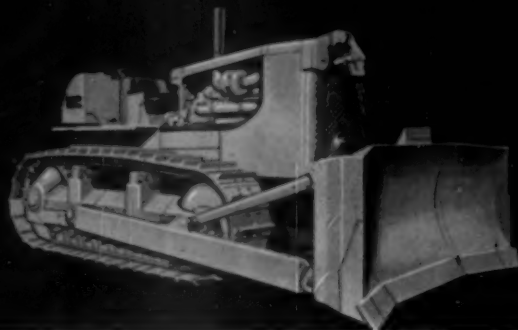
Sales agreement links three major producers

Under a long-term sales agreement, Johns-Manville Corp. will market gypsum products of Bestwall Gypsum Co., while Bestwall and Certain-teed Products Corp. handle Johns-Manville insulation board in the West Coast area. The three producers may broaden the terms of the agreement in the future.

Please turn to page 61

385 HP! FROM CATERPILLAR...THE NEW D9G





NEW D9G: 385 HP, 64,800 LB., POWER SHIFT,

For high-volume dozing, pushloading or ripping, the new D9G has what it takes... at minimum cost per yard!

The engine in the new D9 delivers 385 flywheel horsepower. That's *100 more horsepower* than the first D9 introduced five years ago!

Weight: 64,800 lb.—14% more than the first D9!
Torque divider power shift transmission... massive

heavy-duty undercarriage... and power train with new, built-in ruggedness for long life.

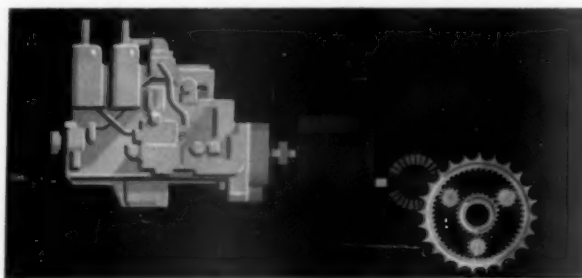
What else is new? Matching the D9G, to make best use of its power, is a full line of attachments. Cable controls, hydraulic controls, pushing equipment, dozers, rippers and others—all designed to help this new tractor really put out on the toughest big jobs.

CAT D353 ENGINE AND MATCHED POWER TRAIN

Engine: This engine, rated at 385 HP (flywheel) at 1330 RPM, has been proven over thousands of hours on the roughest jobs. Cat-built, its 6.25" x 8" 6-cylinder design now incorporates these new features:

- **Controlled Turbocharging**—This system, found only in the D9G among crawler tractors, automatically forces more air into the cylinders during lug. Result: increased maximum torque, fast engine response over a wide range of operation.
- **Aftercooler**—Air leaving the turbocharger passes through a water-cooled heat exchanger. Cooled air has greater density. Thus, more air can be packed into the cylinders, giving greater power output and efficiency.
- **PLUS**—Shroud-mounted fan with torque limiting clutch provides maximum cooling during lug and reduces fan-absorbed HP by 30%. Exclusive Caterpillar fuel injection system allows use of low-cost fuel. Also, twin dry-type air cleaners... oil-jet-cooled pistons... "Hi-Electro" hardened cylinder liners and crankshaft journals.

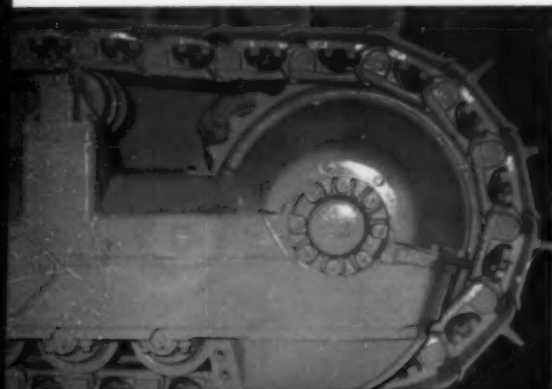
New Power Train: Major advances in the D9G's new power train include *new oil-cooled steering clutches and brakes, new planetary final drives, and a time and cost saving common lube system.*

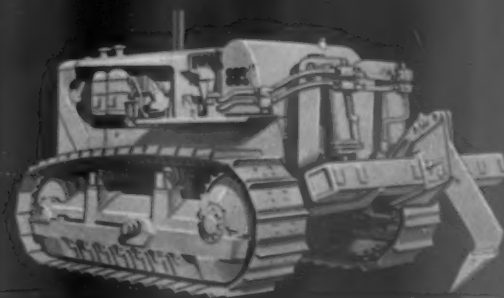
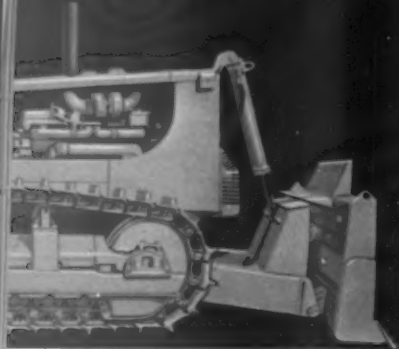


The new steering clutches, spring engaged and hydraulically released, need no adjustments. The longer service life of this type of clutch, as well as that of oil-cooled brakes, has been proven by millions of hours' use on D8H Tractors.

The new planetary final drives increase gear reduction ratios from 8.8:1 to 18:1, materially reducing torque load on all other power train components. A common system cools and lubricates torque divider, transmission, bevel gear, steering clutches and brakes. This means one service point... one type of oil. Final drives have their own pressure lube systems complete with pump, filter and disposable element.

Entire power train has unitized construction for fast, individual removal of components.





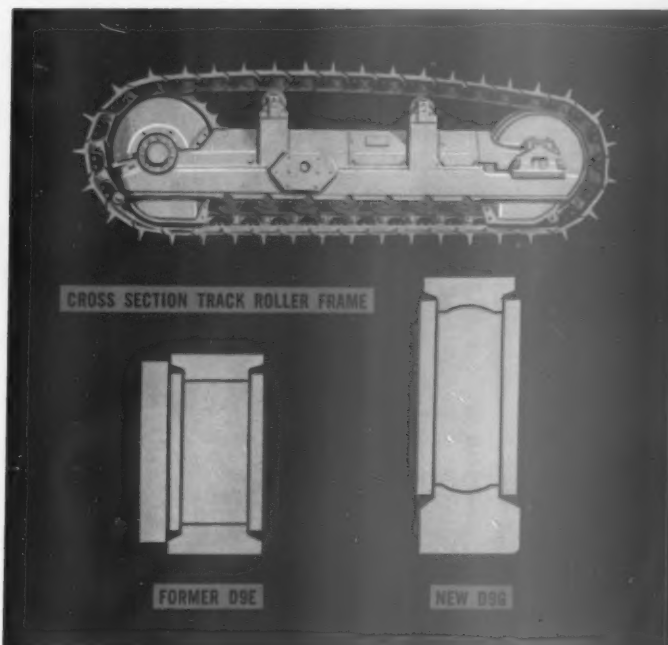
HIGH-PRODUCTION DOZER, PUSHER, RIPPER



PROVEN TORQUE DIVIDER POWER SHIFT:

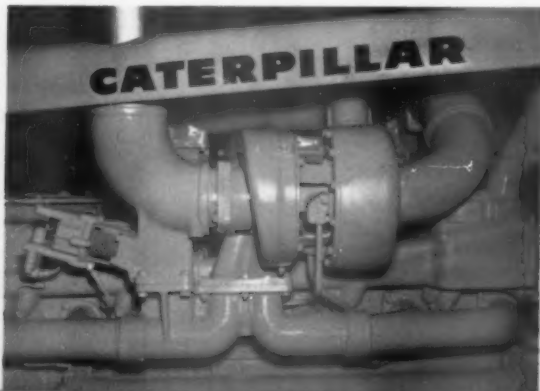
Standard equipment on the D9G, this exclusive Caterpillar design combines the efficiency and "snap" of direct drive with the load-matching and anti-stall characteristics of a torque converter.

A single lever gives the operator finger-tip control of his machine. It adds up to fast cycle times, less operator fatigue with greater efficiency. You get more out of the machine *all day*.



MASSIVE HEAVY-DUTY UNDERCARRIAGE:

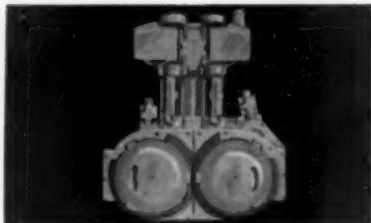
Immense strength and rigidity have been built into the D9G undercarriage to make it more than equal to the roughest ripping job. Box section frame is wider and deeper than previous models. Hydraulic track adjusters are standard. Lifetime lubricated rollers with special alloy deep hardened rims assure long life . . . and they require no servicing until rebuilt. These features give the D9G the finest big tractor undercarriage ever built.



The NEW 385 HP D9G—with high-production attachments

The D9G is big...and, it becomes versatile, too, with the many matching attachments your Caterpillar Dealer offers. Cable controls, hydraulic controls, rippers, dozers, pushing equipment, scrapers and others help make the D9G the most productive big tractor available.

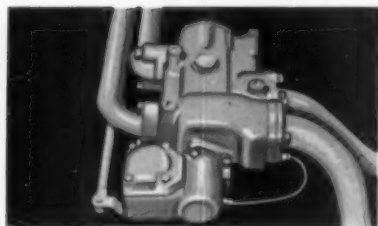
To prove the D9G's productive capabilities on your job, talk to your Caterpillar Dealer.



New cable controls have larger clutch, brake and drum capacities and are hydraulically boosted. Available in front or rear single drum for dozer application. Rear single drum may be converted to double drum at any time. You buy what you need.



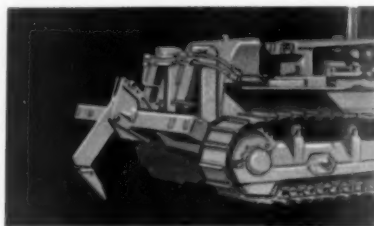
No. 9U can increase dozing production as much as 50%. Also available are No. 9A and No. 9S. Tilt cylinder can be used with U or straight blade. Choice of hydraulic or cable control for all blades. Hydraulic dozers have "quick-drop" valves.



New hydraulic controls available in nine arrangements to meet every application need.



No. 9C dozer combines dozing and cushioned pushing functions into one attachment. As a pusher, it allows 3 MPH cushioned contact. Rear-mounted cushion push block also available for tandem pushing.



No. 9 ripper—5-position clevis, selection of shanks and tips, quick-change features adapt No. 9 to a variety of materials and conditions... results in considerable savings over drilling and blasting.

Caterpillar Tractor Co., General Offices, Peoria, Illinois, U. S. A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

Industry News

continued from page 56

It's Ideal scholarship time again, winners chosen

For the fourth year Ideal Cement Co., Denver, Colo., has awarded National Merit Scholarships. The scholarships, which go to outstanding high school seniors in the 14 states containing Ideal operations, include a stipend for the winner depending on need and a grant to the chosen university or college. They are valued up to \$6,000.

The 1961 winners are: Linda Clark, Ft. Collins, Colo., who plans to study physical science at Pomona College, Claremont, Calif.; Claude Roger Riley, Knox-

What's coming in July

The City of San Diego, Calif., now recalcines the precipitated carbonate sludge from its water filtration plant. The July issue of Rock Products will describe how and why the city installed this process

ville, Tenn., who will take up electrical engineering at the University of Tennessee, and Robert Price, Little Rock, Ark., who will major in chemistry at Columbia University, New York.

ASTM '60 Supplements off the press

The American Society for Testing Materials has announced its 1960 supplements to the Book of ASTM Standards, which is published triennially. Of especial interest to the rock products industry are Parts 4 and 5. The former, a 240-page treatise on Cement, Concrete, Mortars, Road Materials, Waterproofing and Soils, includes 40 standards for the above, as well as joint fillers, gypsum, aggregates and curing materials.

Part 5—Masonry Products,

Ceramics, Thermal Insulation, Acoustical Materials, Sandwich and Building Constructions and Fire Tests—contains 44 standards for asbestos-cement products, manufactured masonry units, pipe and ceramic white-ware, acoustical materials, sandwich constructions, drain tile,

refractories, porcelain enamel, glass, thermal insulating materials, and tests for building construction and for fire.

Each Part is available at \$4 from the Society at 1916 Race St., Philadelphia 3, Pa. The complete set of 10 is \$40.

Please turn to page 63

BALDERSON U-DOZERS MOVE MORE



From Atlantic to Pacific, Texas to Minnesota, loose material handlers are praising Balderson U-dozers. Production increases of 50 to 100 per cent are common. The why is simple.

This U-dozer carries the same load as a straight blade, plus the extra material pocketed by the wider and higher U-design. Add excellent craftsmanship, quality material, and long experience to this basically better design, and you have the best in blades . . . the Balderson U-dozer. Contact your Caterpillar dealer now for more information.

BALDERSON
WAMEGO KANSAS

INC.
U. S. A.

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

Please send me more information on teaming Balderson U-blades with Caterpillar machines. I am mainly interested in a Balderson U-blade for a Cat _____ (model) for _____ (use)

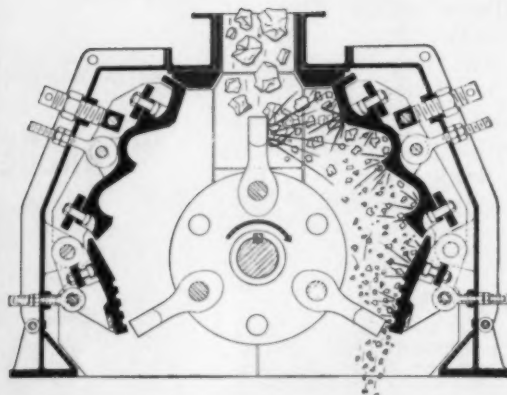
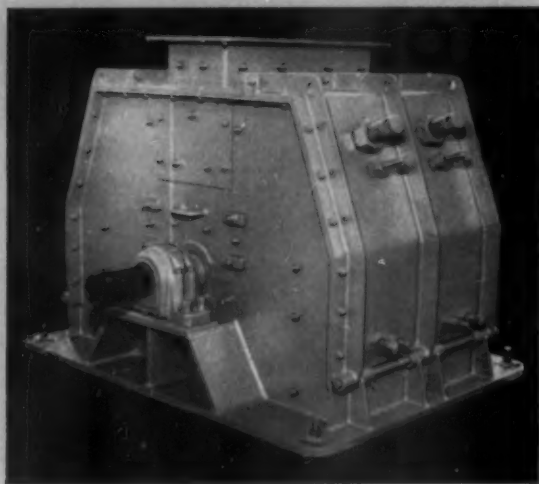
NAME _____

ADDRESS _____

CITY _____

STATE _____

"DOUBLE IMPACT" ACTION of Pennsylvania Fine Reduction Reversible Impactors gives better product at lower costs... for producers of fine cubical aggregate or manufactured stone sand



● Pennsylvania 7-38 Fine Reduction Reversible Impactor.
Note "double impact" action in cross-section drawing.

Because of "double impact" action—in which stone is crushed by repeated impact back-and-forth between hammers and breaker blocks—Pennsylvania Fine Reduction Reversible Impactors can produce for you a well-graded, fine cubical product . . . at profit-making costs. Note, also, these other unique cost-saving features:

ADJUSTABLE BREAKER BLOCKS—Both upper and lower breaker blocks are adjustable. Permits maximum control of circulating load and product gradation.

LESS WEAR—Longer life for hammers and breaker blocks built of cast alloy steel. Side liners, heat-treated carbon steel.

EASY ACCESSIBILITY—Entire breaker block assembly swings back, exposing rotor assembly for quick inspection.

IDENTICAL REDUCTION—Position of breaker plates and feed chute results in identical reduction when crusher is run in either direction.

LOWER MAINTENANCE—Rotor reversal balances wear, eliminates hand turning of hammers, saves labor and parts.

material—and specifications for the finished product you want. At no obligation or expense to you, we will run tests in our laboratory and give you the results and recommendations.

FREE BULLETIN

Your Pennsylvania Engineer will be glad to discuss these crushers with you . . . or write for free bulletin.

PENNSYLVANIA CRUSHER DIVISION
BATH IRON WORKS CORPORATION
WEST CHESTER, PENNA.

LET US "PROVE IT"

Send us 100 lb. sample of your ma-

PENNSYLVANIA CRUSHERS

BATH-BUILT



Industry News

continued from page 61

1st Quarter profits trail '60

Due to generally depressed conditions and the accompanying construction lags, many companies are reporting a sink in profits for the first quarter.

	1961	1960
American Potash & Chemical Corp.	\$1,025,142	\$1,278,319
The Flintkote Co.	533,616	1,042,935
General Portland Cement Co.	1,307,200	1,478,400
Johns-Manville Corp.	2,111,000	4,652,000
Lehigh Portland Cement Co.	946,150*	489,317
National Gypsum Co.	2,744,442	3,791,786
Penn-Dixie Cement Corp.	31,979	88,925
U. S. Gypsum Co.	6,673,308	8,211,493

However, a few reports are bearing more cheerful news.

	1961	1960
Ideal Cement Co.	\$2,612,532	\$2,301,615
Louisville Cement Co.	113,899	109,878*
Missouri Portland Cement Co.	361,270	137,296

*these figures represent losses

Interstate System prodded by Fallon bill

Rep. Fallon (D-Md.), chairman of the House Public Roads Subcommittee, introduced a bill authorizing \$11.760 billion in additional expenditures for fiscal years 1963 to 1971, as shown in this table:

Fiscal year	Present law (billions)	Fallon bill (billions)
1963	\$2,200	\$2,400
1964	2,200	2,600
1965	2,200	2,700
1966	2,200	2,800
1967	2,200	2,900
1968	1,500	3,000
1969	1,025	3,000
1970	—*	3,000
1971	—*	2,885

*Authorizations for fiscal years 1970 and 1971 are new

Pennsylvania to Philippines—long haul for cement plant

Equipment for a 3,000-bbl. per day plant is being shipped all the way from Allentown, Pa., to the Mindanao Portland Cement Co., Iligan City, Mindanao, Philippine Island. Covering it is a \$2.5 million contract with the Fuller Co. and its subsidiaries.

Please turn to page 64

SIMPLIFY YOUR BUCKET ELEVATOR SPLICING WITH . . .

FLEXCO® BELT FASTENERS



Installation at Ready Mixed Concrete Co., 908 West 25th Street, Kansas City, Missouri.

PERFORMANCE YOU CAN DEPEND

ON: The bucket elevator belt shown above, furnished by Republic Rubber Co. of Ohio, was installed in March, 1959 to replace a belt on which there were 9 repair lap joints. The FLEXCO splice pictured is the original installation. Only a negligible amount of take-up has been required since it was put in service. Belt has handled approximately 150,000-200,000 tons of sand and concrete stone.

PROTECT YOUR INVESTMENT IN CONVEYOR BELTS WITH

FLEXCO . . . the quality fastener for all heavy-duty conveyor belt applications: SAND & GRAVEL, CRUSHED ROCK, CONSTRUCTION EQUIPMENT, COAL & METALS, ETC.



Cutaway of a FLEXCO application showing the compression plates, teeth and precision-made bolts and nuts.

Available in Steel, Monel, Stainless, Everdur. Also promal top plates.

ORDER FROM YOUR DISTRIBUTOR
OR WRITE US FOR BULLETIN F112

"FOR THE SPLICE OF A LIFETIME"

Flexible **STEEL LACING COMPANY**

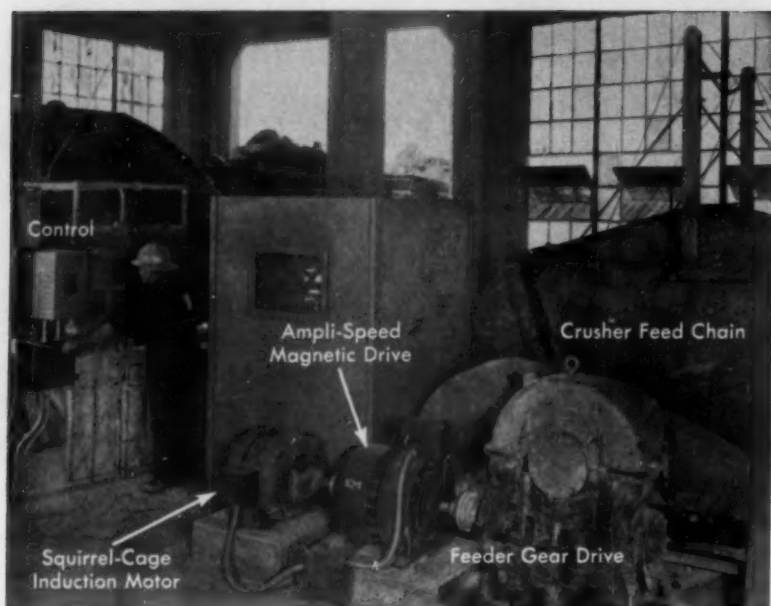
4684 LEXINGTON STREET

CHICAGO 44, ILLINOIS

Enter 1248 on Reader Card

ROCK PRODUCTS, June, 1961

63



CEMENT COMPANY STEPS UP CRUSHER OUTPUT 10%

Stops overloading by automating feeders with E-M AMPLI-SPEEDS

PROBLEM: "How to keep hammermill crushers fully loaded without overloading?" That was the problem facing operators of a large midwest cement plant.

Crushers were severely overloaded when heavy concentrations of rock were loaded onto the traveling feed chains a carload at a time. And to make matters worse, the steadily moving feeders kept right on feeding the already overloaded crushers. Yet, *in between* carloads the crushers were underloaded because the wound-rotor motors driving the feed chains were kept at their lowest speed to minimize overloading.

SOLUTION: Mill engineers replaced the wound-rotor motors with 20 hp, 1750 rpm squirrel cage induction motors they had in stock and installed E-M Ampli-Speed Magnetic Drives between the motors and the feeder gear drives. Simple control

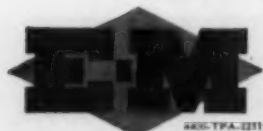
circuits were devised by putting a current transformer in each crusher motor power circuit and feeding its output through a rectifier to the Ampli-Speed Control.

RESULT: Now when crushers start to overload, motor line current signals the Ampli-Speed to stop the feeder. When the threatened overload passes, crusher motor line current drops and the feeder moves forward. This automatic start-stop action of the E-M Ampli-Speeds keeps the crushers fully loaded but never overloaded. Time saved between carloads by the increased speed of the feed chains has stepped up output 10%.

Do you have a speed control problem? . . . Ask your nearby E-M speed control expert for help. He will be glad to give you details about precise, adjustable control with Ampli-Speed. Also, write the factory today for Bulletin No. 1140-RP.

Somewhere in your plant an operation can be improved with smooth, adjustable speed control . . .

DO IT YOURSELF WITH AMPLI-SPEED



Enter 1249 on Reader Card

**ELECTRIC MACHINERY
MFG. COMPANY**

Minneapolis 13, Minnesota

Industry News

continued from page 63

Vermiculite producers gather in Arizona

On March 18-23 the Vermiculite Institute of Chicago held its annual meeting in Chandler, Ariz. Officers elected were: president—L. J. Venard, Minneapolis, Minn.; treasurer—R. W. Sterrett, Chicago, Ill.; managing director—Edward R. Murphy; directors—L. K. Irvine, Salt Lake City, Utah, C. E. Goyer, Montreal, Que., C. H. Wendel, Los Angeles, Calif., Venard and Sterrett. Two new members were voted into the Institute—Cleveland Gypsum Co., Cleveland, Ohio, and Tennessee Zonolite Co., Nashville, Tenn.

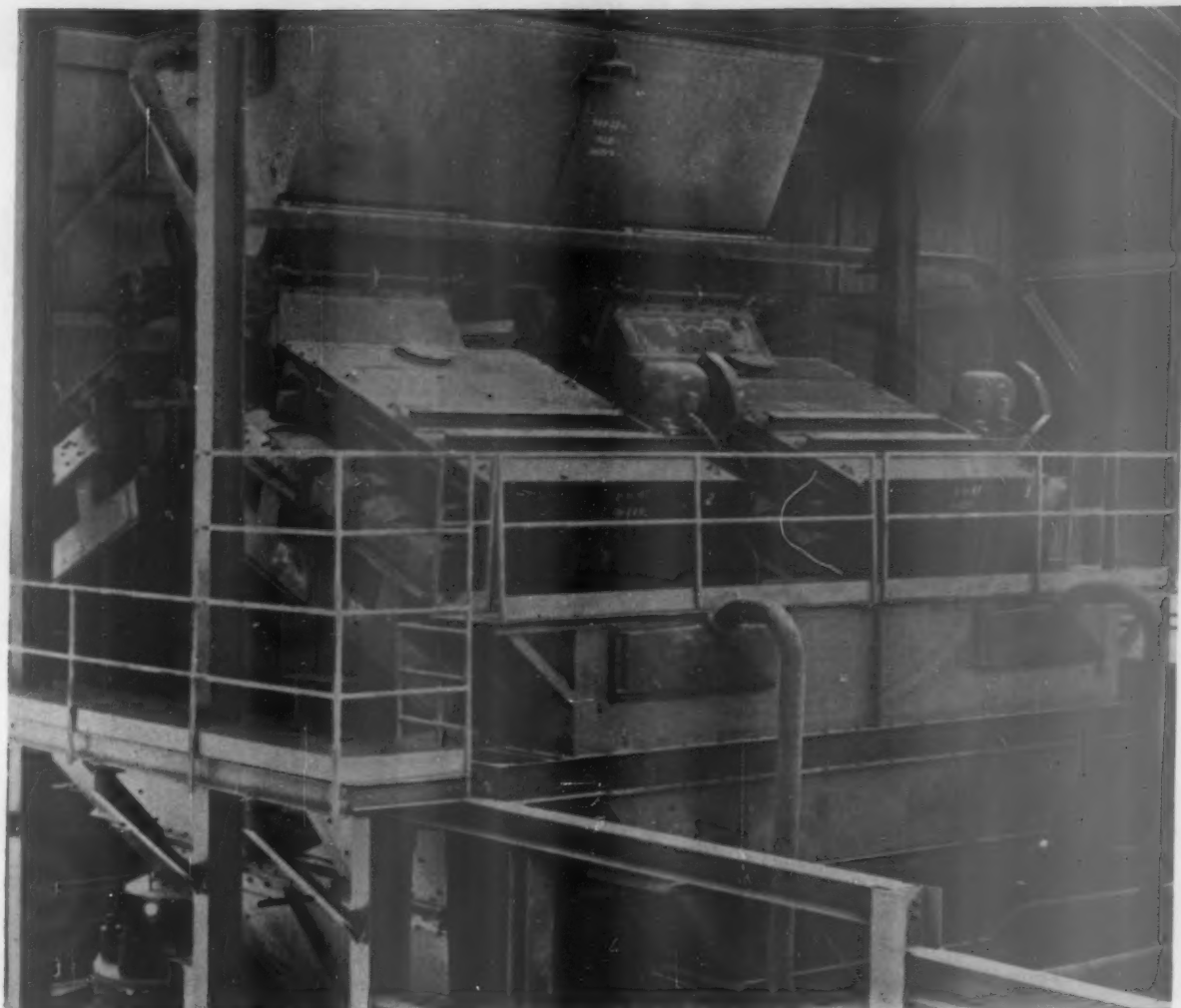
Committee chairmen reported a successful 1960, and were most optimistic looking into the future. Vermiculite masonry wall insulation and fireproofing have met with enthusiastic response, as has the acoustical plastic. The masonry fill insulation was formally accepted for national use by the Federal Housing Administration March 1.

Additional thriving markets were found and are predicted for vermiculite concrete roof decks—45 million sq. ft. were applied last year alone. Too, large tonages of agricultural vermiculite are being used for conditioning fertilizers and in mosquito abatement programs.

Dundee landscaping cited

A citation and a U. S. Savings Bond in appreciation of its landscaping improvement efforts were presented recently to Dundee Cement Co.'s Chicago Distribution & Service Center by the South Chicago Chamber of Commerce. The award recognized the company's contributions to and confidence in the area's growth.

Please turn to page 68



In 7 years of operation Tyler Ty-Rocks screen 15,000,000 tons of ore at Silver Bell Mine... "maintenance virtually nil"

These four single-surface Ty-Rock screens at the Silver Bell Mine of American Smelting and Refining Company have screened mountains of copper ore. Yet in seven years of operation the company reports "no bearing or other major replacements, and maintenance virtually nil"... a tribute to the fine operating staff and to the design of the equipment.

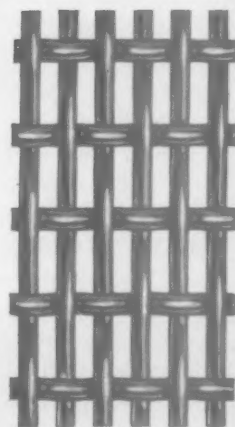
Tyler vibrating screens handle tremendous outputs with very high reliability. And no matter what your screening requirements, Tyler can handle them: heavy duty mechanical screens, electric screens, economical two-bearing screens. And—Tyler is the world's largest manufacturer of wire cloth and fabricated screen sections.

For screening equipment perfectly matched to your needs check with Tyler.

THE W. S. TYLER COMPANY — Cleveland 14, Ohio

OFFICES: Atlanta • Boston • Chicago • Dallas • Los Angeles • New York • Philadelphia • Pittsburgh • Salt Lake City • San Francisco

THE W. S. TYLER COMPANY OF CANADA, LIMITED, St. Catharines, Ontario • Office: Montreal, Quebec
WOVEN WIRE SCREENS • SCREENING MACHINERY • TESTING SIEVE EQUIPMENT



Enter 1209 on Reader Card

"C'mon...climb aboard

**see how the new '15' beats the
tracks off anything in its hp class"**

"We want you to have first crack at this new workhorse that'll run rings around anything in its hp class—for the dirt it can 'doze, the bucks it can save, the aches it can end.

"It's the new International TD-15, and we guarantee it can show you in only 15 minutes why it heads up its hp class—and what that means to you in money in the bank!

"We'll show you how and why this new '15' can pick up and 'run' with loads that make other rigs sit and 'spin their tracks.'

"We'll show you 1961 operating ease, reliability, and speed—that can add up to a big bundle of cold cash in a season's run.

"We'll show you get-up-and-go that cuts 'dead-heading' back-up time as it's never been cut before—with the 6-speed, full-reverse transmission, and Shuttle-Bar direction changing.

"We'll prove to you—in your own language—that the new TD-15 can make you far more

money, for more years, than anything in its horsepower class.

"C'mon in now and spend 15 minutes on a new '15'! Or call us for a demonstration on your job. See for yourself how it's tailored to your operation."

"Start the new '15's' 6-cylinder Diesel engine with push-button ease—see how you save warm-up minutes with International's famous gasoline-conversion starting. Compare the positive engine temperature control you get with pressure-type cooling and reserve capacity radiation!"



***International
Construction
Equipment***

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Illinois
A COMPLETE POWER PACKAGE

and bury the blade...

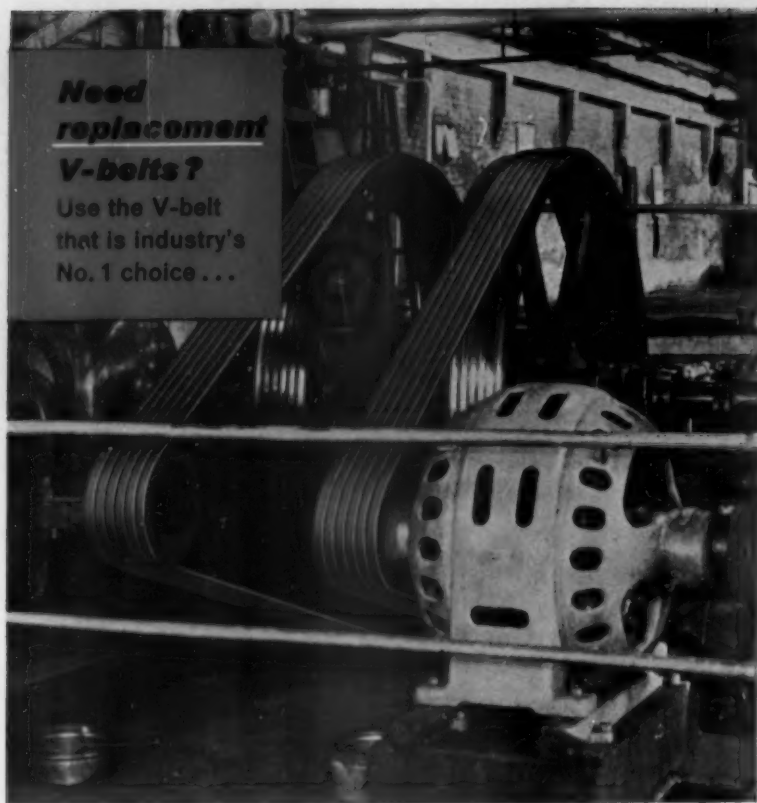


"Prove the new International TD-15 on full loads, part loads, intermittent loads. Prove it on jobs where high torque power and long track traction count."



**Need
replacement
V-belts?**

Use the V-belt
that is industry's
No. 1 choice...



Gates Hi-Power V-Belts give you longer service life on your drives

Concave sidewalls (U.S. Pat. No. 1813698)—

It is easy to see why Gates Hi-Power V-Belts give far longer belt life than ordinary V-belts. Just make this simple test: Bend a Gates V-Belt as if it were going around a sheave. Feel how the concave sides (Fig. 1-A) fill out... become perfectly straight (Fig. 2-A) to make full contact with the sides of a sheave. The belt thus grips the sheave evenly, and distributes wear uniformly across the sides of the belt, lengthening belt life.

Precisely-engineered arched top—The arched top (Fig. 1-B) of the Gates Hi-Power V-Belt prevents any distortion of the tensile section cords as the belt bends around the sheave... the load is uniformly distributed with each cord carrying its full share.

You will get fast delivery of Hi-Power V-Belts from the local stock of your nearby Gates Distributor. Call him today.

The Gates Rubber Company
Denver, Colorado

FIG. 1



FIG. 2



Gates Hi-Power
V-Belts are quickly
available everywhere.



Gates Hi-Power V-Belts

Enter 1250 on Reader Card

Industry News

continued from page 64

Highway Trust Fund reports on first two months

During the first two months of 1961, the Highway Trust Fund improved its surplus position while paying back, with interest, the \$60 million advance from the general fund made in October of last year. Total receipts for the period came to \$457,747,704. Total expenditures were \$436,849,305. As of February 28, the Trust Fund surplus of \$144,637,015 included \$71,124,000 in Treasury Certificates bearing an interest rate of 3.125 percent.

Marquette to expand Catskill plant by 50 percent

Marquette Cement Manufacturing Corp. is putting \$11 million into the Catskill plant it acquired after its merger with North American Cement Corp. of New York. The expansion will increase production capacity by 50 percent. In addition, Marquette plans to improve river and coastal transportation from the Catskill plant and build a permanent shipping point on Long Island.

Articles of incorporation

Novelty Quarry & Construction Co., Seattle, Wash., has been incorporated with a capitalization of \$100,000 to operate rock quarries and gravel deposits, earth excavations and fills. Directors are Harold J. Johnson, Clarence L. Hotaling, Charles G. Lamb and Eugene J. Ostrom.

American Perlite Co., Los Angeles County, Calif., has been incorporated to mine volcanic silicates. Directors are F. Ernest Duncan, Martha Dominguez and Louis Elowitz: capitalization is \$25,000.

Despite general downturn, some report income rise

These firms claimed an increase in net income for 1960 over 1959.

	1960	1959
Lock Joint Pipe Co.	\$3,330,000	\$2,962,000
Asbestos Corp., Montreal	3,259,653	3,057,379
Eastern Lime Corp.	375,493	356,745
Canada Crushed & Cut Stone Ltd.	345,509	343,936

NCSA discusses salesman's role

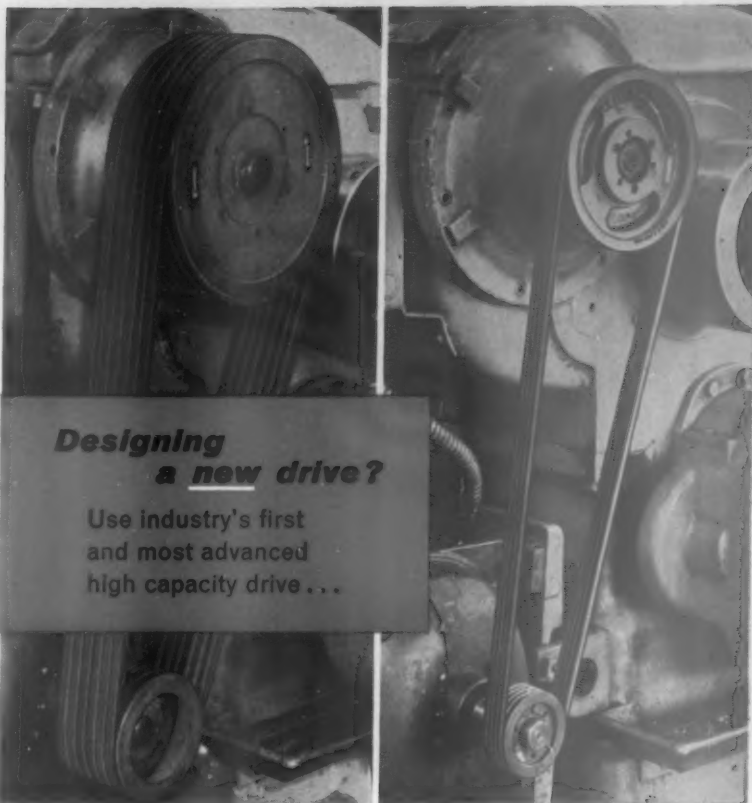
A highlight of the January convention of the National Crushed Stone Association was a five-speaker session dealing with the Salesman's Role in the Crushed Stone Industry. The Association felt that the personal experiences of these leaders in the field were important enough to transcribe into a booklet. A limited number are available at \$1.50 each from the NCSA, 1415 Elliot Pl., N.W., Washington 7.

Greater phosphate profits with water transport

A research man from Battelle Memorial Institute, Columbus, Ohio, envisions a gradual turn to water transportation of phosphate, with resulting profit rises for the producers and lower fertilizer costs for the farmer. Present shipping costs, according to Odin Wilbelmy, Jr., are often substantially more in many cases than the costs of mining the rock and beneficiating it for use in fertilizer.

Of course, at present there is some movement of phosphate by water. But in order to establish large-scale shipment, more joint barge-rail or barge-truck arrangements must be made. Grinding and terminal storage facilities must be established or relocated, and of course economic procedure developed.

Please turn to page 70



Designing a new drive?

Use industry's first
and most advanced
high capacity drive...

Gates Super High Capacity V-Belts save drive space, weight, money

If you are designing a new drive, or if the belts and sheaves of a conventional V-belt drive must be replaced, you will benefit many ways by installing a Gates Super HC High Capacity V-Belt Drive.

Gates Super HC V-Belt unites new, high performance materials with a basic change in the shape of the belt itself. Because of this, it is able to handle up to 3 times the horsepower of a conventional V-belt in the same space. As a result, Gates Super HC Drives can often cut in half the space required for your drive. Drive costs are cut as much as 20%, and drive weight reduced 20% and more. Guards can be smaller. Bearing loads are less, increasing bearing life. And the drive can operate at belt speeds up to 6000 ft/min without dynamic balancing!

There is a Gates Field Engineer serving your area. To contact him for help in designing a new drive, call your nearby Gates Distributor.

The Gates Rubber Company
Denver, Colorado

Gates Super HC
Drive saves space,
weight and money

Exclusive design
features include:
precisely engineered
arched top,
concave sidewalls,
Flex-Weave cover,
super strength
tensile construction.

Gates

Building the
future on
50 years of
progress

Gates Super HC V-Belt Drives

Enter 1251 on Reader Card

This Bond Is an Investment in You

Guarantee Bond
ON USED EQUIPMENT

Knows All Men by these Presents,

that _____ (hereinafter called Seller),
of _____ (hereinafter called Buyer),
do hereby bind themselves, their heirs, assigns and assigns jointly by these presents,
to the sum of not exceeding the lesser of TEN THOUSAND DOLLARS (\$10,000.00),
or Seller's price for the better described used equipment, for the payment of which
Seller hereby binds itself, its successors and assigns jointly by these presents.

Warranty: Condition of this obligation is such that Seller has sold to Buyer the below-
described used equipment originally manufactured by Caterpillar Tractor Co. or any of
its subsidiaries:

Description _____
Model No. _____
Serial No. _____

Seller warrants with certain attachments, original manuals, and
warranty book guaranteeing said equipment and attachments against unsatisfactory performance
due to defective parts for _____ days after the date of sale shown
below (except as hereinafter provided), the obligation under this guarantee being
only to replace any parts which prove defective under conditions of normal use during
the guarantee period to Seller's expense (including cost of all necessary materials and labor)
up to a maximum of the lesser of Ten Thousand Dollars (\$10,000.00), or Seller's price
for said equipment, except that the cost, if any, of transporting said equipment and/or
attachments from and to the Seller's place of business shall be paid by the Buyer.

Limit: Therefore, if Seller, its successors and assigns shall in all respects well and truly perform
the obligation under the guarantee recited above, then this obligation shall be void, otherwise
to remain in full force and effect.

THE ABOVE GUARANTEE IS VOID, AND SELLER SHALL BE UNDER NO OBLIGATION
THEREUNDER, IF CLAIM IS NOT MADE TO THE SELLER WITHIN THIRTY (30) DAYS
AFTER DISCOVERY OF THE DEFECT UPON WHICH THE CLAIM IS BASED.
This guarantee is made or confirmed to be made by Seller other than that shown at fault.

Printed and Issued _____ 1961

Signed by your Caterpillar Dealer, this bond gives you up to \$10,000 worth of machine dependability



Bonded Buy means guaranteed machine dependability. You can get a completely-checked, used Cat-built machine that has the Cat Dealer's confidence and guarantee, PLUS this bond from Lumbermens Mutual

Casualty Company that backs up your machine with as much as \$10,000 worth of parts and labor for the period you and the dealer agree upon.

See your dealer. Read the bond. Check the details. This guarantee can apply on your next used machine. And you pay no extra premium for this assurance. Dependable Bonded-Buy machines are priced right—and your Cat Dealer offers terms to match your needs. Call him or see him soon. Do business with the man whose business is built on dependability.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

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Industry News

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Soviets adopt 5-year plan for cement growth

Cement production in Russia has failed to keep pace with the nation's rapidly growing needs. According to Izvestia, the Central Committee of the CPSU and the Council of Ministers of the USSR have adopted measures to accelerate the industry's growth during the years 1961 to 1965. Predicted cement output for that year is 84.6 million tons.

Provisions are made for the construction of 26 new cement

What's coming in July

Tough, hard limestone formations at Hudson posed difficult crushing problems for Lone Star Cement Co. Read in July how it took an entirely new crushing system to hold the line in this phase of raw material preparation

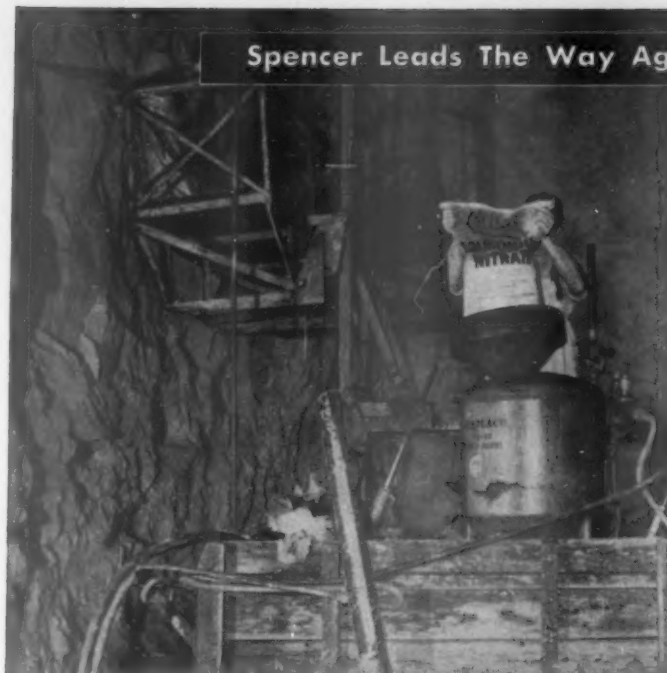
plants, in addition to the expansion and reconstruction of 45 plants now in operation. The Kazakh and Uzbek Republics and East and West Siberia are to receive special attention, which will improve the geographical distribution of plants.

There is great interest in improving the quality of cement and the assortment of grades. Authorities predict that the nation will be producing 55 million tons of high-grade portland cement by 1965. Concurrently the percentages of slag portland cement and pozzolan cement will decrease.

Technical measures call for the introduction of 16½ x 608-ft. kilns with 75 tph. output capacity for the wet method and 13¼ x 197-ft. kilns with 35 tph. capacity for the dry method. Process automation is encouraged, and as a result, the machine-building plants will also receive adequate aid.

END

Spencer Leads The Way Again . . .



A two-man team makes short work of filling blast holes with a Spencer Powder Monkey pneumatic machine and Spencer N-IV Ammonium Nitrate and fuel oil mixture. This is the fastest, most economical loading method known.



No tamping required! Spencer N-IV and fuel oil compound loaded with a pneumatic machine completely fills the holes to the proper density for maximum blast efficiency.

Now Spencer N-IV Goes Underground ... Cuts Explosive Costs 40% to 50%

Leading the way to lower costs in underground blasting, Spencer's technical experts began more than three years ago to pioneer the use of Spencer N-IV Ammonium Nitrate and fuel oil mixtures in sub-surface mines. Today, Spencer N-IV is being successfully used in many underground mining operations.

The successful application of an ammonium nitrate and fuel oil mixture in underground blasting depends on:

- A special grade ammonium nitrate such as Spencer N-IV.
- The technical service experience of Spencer personnel who have handled millions of pounds of N-IV in underground mining.

Spencer N-IV should be used only in underground blasting applications such as limestone, salt, potash, granite, iron ore, gypsum, copper and uranium. This ammonium nitrate and fuel oil blasting agent is in no way to be construed as a permissible and is not to be used in underground coal mining.

Here are some of the important advantages of using Spencer N-IV Ammonium Nitrate and fuel oil in underground mining:

- Explosive costs are reduced 40% to 50%** when Spencer N-IV and fuel oil mixture is used instead of dynamite. Compared on a pound for pound basis with dynamite, Spencer N-IV produces at least equivalent performance, yet the per pound price of Spencer N-IV is far less.
- Drilling costs are lowered** because Spencer N-IV provides reliable blasting in small diameter holes where formerly dynamite was required. The uniform, round

prills of Spencer N-IV flow freely to permit ideal loading density in holes as small as $1\frac{1}{8}$ inches in diameter.

3. Faster, more economical loading is achieved by using Spencer N-IV to fill horizontal blast holes with a pneumatic loading machine—such as the Spencer Powder Monkey. For example, where this advanced loading method is being used, operators report that more than 250 holes can be filled and blasted in a regular eight-hour shift. More than 40 Spencer Powder Monkeys are presently in operation in underground mines.

4. Fragmentation is excellent—using Spencer N-IV for underground blasting, experience indicates that fragmentation results are equal or superior to those produced by dynamite.

For up-to-date information on lowering your underground blasting costs with Spencer N-IV Ammonium Nitrate and fuel oil mixtures, just return the coupon below.

Spencer Chemical Company
405 Dwight Bldg.
Kansas City 5, Missouri



Please rush me the latest information on cutting underground blasting costs with Spencer N-IV and fuel oil mixtures.

Name _____
Firm _____
Address _____
City _____ State _____

**'61 FORD <sup>TANDEM
AXLE</sup> TRUCKS**
BROADER WARRANTIES...
GREATER DURABILITY...
BIGGER CHOICE!



FORD DIVISION, *Ford Motor Company*.

FORD HAS WARRANTED TO ITS DEALERS, WHO IN TURN WARRANT TO YOU:

- **New Super Duty V-8 Engines for 100,000 miles or 24 months!**
- **New Ford Trucks for 12,000 miles or 12 months!**

Ford's rigid quality control program gives you unsurpassed dependability! Positive evidence of uniformly high production and inspection standards is the exclusive new 100,000-mile engine warranty. On 401-, 477- and 534-cu. in. Super Duty V-8 engines, each major engine part (including block, heads, crankshaft, valves, pistons, rings), when engine is used in normal service, is warranted by your dealer against defects in material or workmanship for 100,000 miles or 24 months, whichever comes first. Warranty covers the full cost of replacement parts . . . full labor costs for the first year or

50,000 miles, sliding percentage scale thereafter.

In addition, an extended warranty covers all 1961 Ford Trucks of any size. Each part, except tires and tubes, is now warranted by your dealer against defects in material or workmanship for 12 months or 12,000 miles, whichever comes first. The warranty does not apply, of course, to normal maintenance service or to the replacement as normal maintenance of such items as filters, spark plugs and ignition points. *No other trucks give you such protection for your investment; never before could you be so confident of long-range durability!*



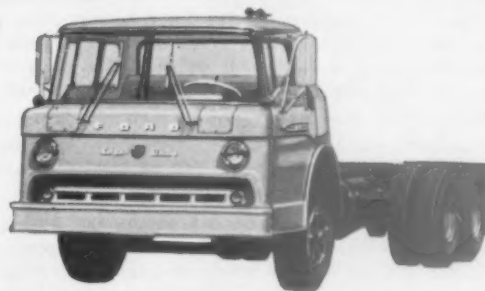
Tougher tandems offer greater strength in chassis, cab and sheet metal for longer life. Full-Torque fly-wheel power take-off is available for more efficient drive of transit mixers and heavy-duty equipment.



Timken or Eaton rear axles, with capacities up to 38,000 lb., are available in all Super Duty tandems. High capacity front axles have wider track for increased stability when cornering or in rough terrain.



GVW's up to 51,000 pounds permit big, profitable payloads. Heavier gauge metal and stress-isolating independent mounting for radiator, fenders and cab give you greater durability.



Tandem Axle models are available with tilt cabs. As with conventional tandems, aluminum walking beams, wheels and fuel tanks are offered to cut weight . . . increase payload capacity.

**QUALITY-BUILT...
MAINTENANCE-
ENGINEERED**

FORD TRUCKS COST LESS



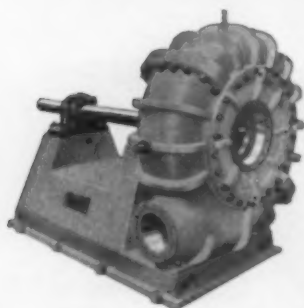
IF THESE CLAIMS SEEM UNBELIEVABLE—



Our customer says to
phone him for the facts
about his 2-year-old

THOMAS

Durable Dredge Pump



If you knew a man who was saving several hundred dollars a month in sand-and-gravel pump maintenance and repairs you would want to investigate the facts.

R. Patrick Spangler is doing just that. He operates Spangler & Sons, Inc., a prominent firm doing a ready-mix concrete and concrete construction business in Shelby, North Carolina. He operates a 6" THOMAS Durable Dredge Pump with which he has had no pump repair or maintenance expense in over two years, as compared with frequent repairs and adjustments necessary for the pump he was using previously. Mr. Patrick says that never in his experience has he bought a piece of equipment which so far exceeds the claims and commitments of its manufacturer. Read his letter at right.

"If anybody doubts what I say," states Mr. Spangler, in a phone conversation, "have them call me and I'll give them the facts straight from the shoulder."

No other sand and gravel pump equals the Thomas in performance because the Thomas Pump is uniquely and especially designed to be made of genuine dependable THOMAS NI-HARD—one of the hardest and most abrasion-resistant metals of the foundry industry. "You cannot buy at any price a more durable pump than a THOMAS for sand and gravel—you cannot buy one that will make you as much money." Additional information gladly furnished upon request.



SPANGLER & SONS, INC.

Transit Mix Concrete



Concrete Construction

P. O. Box 1270

Shelby, N. C.

March 14, 1961

Thomas Foundries
P. O. Box 1111
Birmingham, Alabama

Dear Sir:

We would like to have our name included in your list of satisfied customers. Truly, it is amazing what your Thomas durable pump has done for our sand business.

Our Thomas dredge pump was purchased in August of 1958, and was put into operation in November of the same year.

Before installing your pump, we were putting in parts and making repairs every few weeks. Since the purchase of the Thomas we have had no maintenance problems. In fact, we have not, as yet, replaced a single part.

It is an extreme pleasure to be doing business with people such as yourself. Your Thomas pump has been everything you said it would be and even more.

Yours very truly,

SPANGLER & SONS, INC.

R. Patrick Spangler
R. Patrick Spangler

Top: R. Patrick Spangler, ready-mix concrete operator of Shelby, North Carolina.

Above: Mr. Spangler's letter describing his 2-years experience with a THOMAS Durable Dredge Pump.

Thomas Durable Dredge Pumps are manufactured in range of sizes from 6" to 16" discharge. Write or phone for additional information.



THOMAS FOUNDRIES Inc.

P. O. BOX 1111, BIRMINGHAM, ALABAMA



Enter 1280 on Reader Card

CALENDAR

of coming events

1961

June 25-30, 1961—American Society for Testing Materials, 64th Annual Meeting, Chalfonte Haddon Hall, Atlantic City, New Jersey.

July 13-14, 1961—National Crushed Stone Association, Mid-year Meeting, Board of Directors, The Greenbrier, White Sulphur Springs, W. Va.

July 20-21, 1961—Expanded Clay and Shale Association, Mid-year Meeting, Americus Hotel, Allentown, Pa.

August 10-12, 1961—National Sand and Gravel Association—National Ready Mixed Concrete Association, Controllers Conference, Edgewater Beach Hotel, Chicago, Ill.

August 20-24, 1961—Semi-annual meeting, Board of Directors, National Sand and Gravel Association, The Greenbrier, White Sulphur Springs, W. Va.

September 10-13, 1961—American Mining Congress, Metal Mining & Industrial Minerals Convention, Seattle, Wash.

October 4-5, 1961—National Slag Association, Annual Meeting, Pocono Manor Inn, Pocono Manor, Pa.

October 5-6, 1961—National Lime Association, Operating Meeting, Shoreham Hotel, Washington, D.C.

October 16-21, 1961—National Safety Council, Annual Convention, Conrad Hilton Hotel, Chicago, Ill.

1962

February 4-8, 1962—American Society for Testing Materials, Committee Week, Statler-Hilton Hotel, Dallas, Texas

February 5-9, 1962—National Sand and Gravel Association—National Ready Mixed Concrete Association, 32nd Annual Convention and Biennial Show, Conrad Hilton Hotel, Chicago, Ill.

April 3-5, 1962—American Institute of Electrical Engineers, Cement Industry Technical Conference, Chase Hotel, St. Louis, Mo.

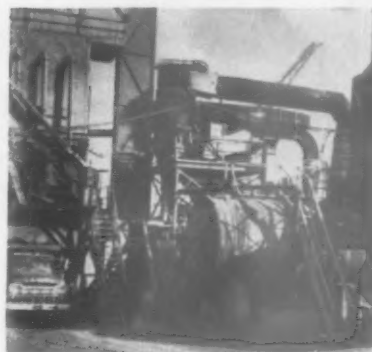
June 24-29, 1962—American Society for Testing Materials, Annual Meeting, Statler Hotel, New York, N.Y.

Syracuse Constructors, Inc., Report on Almasol

(Performance Study #262)

***Lubricant Life Extended
Twelve Times —**

Bearings on asphalt batch plants operated by Syracuse Constructors, Inc., Syracuse, N. Y., such as shown below, are subjected to *severe* heat and pressure. So severe, in fact, that ordinary lubricants had to be replaced *every hour*.



In July, 1959, the Syracuse Asphalt Plant Superintendent, Ray Havens, changed to ALMASOL 1225 BEARING and CHASSIS LUBRICANT—and lubrication intervals were extended to twelve hours, with a wide margin of safety!

***Gear Oil Lasts Full Year
Without Make-Up —**

Furthermore, ALMASOL 608 GEAR LUBRICANT was installed in three particular trucks, previously needing from three to five pounds of gear oil *every week*. These vehicles ran one full year without any make-up oil, thanks to the frictional heat resisting action of ALMASOL 608. This was a saving of between 156 and 260 pounds of gear oil which ordinarily would have evaporated away, in just *three* trucks!

FOR COMPLETE INFORMATION
ABOUT ALMASOL LUBRICANTS —

WRITE, WIRE OR PHONE DEPT. RP-4



**LUBRICATION
ENGINEERS
INC.**

Fort Worth 11, Texas

Custom Built Lubricants for Heavy Equipment

Enter 1253 on Reader Card



Because this big D-120 PAYDOZER
is convertible to a tractor-shovel it

saves \$50,000

by giving you two machines
for about the price of one

One way to help relieve the squeeze on profits created by increased costs and competition is to use more-modern, more-versatile equipment. For example, this powerful, new Pusher-dozer can be converted to the famous H-120 PAYLOADER Tractor-shovel for an additional investment of about 10% for the conversion package. In turn, the shovel can always be changed back to the 'dozer.

This conversion from one to the other can be made quickly whenever it is called for by job stages, new projects, or seasonal conditions. The resulting benefits are greater equipment flexibility and versatility, while the investment cost is almost halved.

As a pusher-dozer:

Speed and Power: A contractor's superintendent says that this big rubber-tired 'dozer is so fast and mobile that it "replaces two crawler tractors." With its 59,000 lbs. weight, 300 h.p. diesel engine, 12' 4" blade, full-reversing, 4-range full power-shift transmission, and speeds up to 25 m.p.h. in either direction it can cycle fast while bulldozing, move quickly to where needed, and move tremendous yardage per hour or per day. Blade pitch and tilt adjustment, as well as raise and lower, are by precise hydraulic power.

Better Traction and Balance: Approved and exclusive use of dry ballast in all four 29.5 x 25 tires gives better weight distribution and a lower center of gravity - dampens tire bounce and permits better blade control. Torque-proportioning differentials on both axles give the most reliable traction.

Matched Torque Converter: A bulldozer and a loader require different torque-converter characteristics. That's why the converter in this 'dozer is designed specifically to develop maximum dozing effort, and a torque-converter change is a part of the 'dozer-to-loader conversion.



As a tractor-shovel:

Big Load Capacity: The H-120 PAYLOADER is available with bucket capacities from 3½ to 8 cu. yds. (S.A.E. rated) depending on the materials to be handled. Exclusive, patented Drott "4-in-1" bucket can also be supplied.

Advanced Boom Design includes the exclusive use of extra-strong "T-1" steel that saves over a ton of dead weight on the load-carrying end. All boom parts are forward and clear of the operator for greater safety and fullest visibility.

More Dumping Clearance and Reach than comparable units. It loads big trucks and rail cars more evenly and easier - stockpiles higher.

Easy Operation because of power-shift, power-steer and 4-wheel power air brakes. "Operators-choice" dual brake pedals - exclusive in its class - lets the operator brake with or without the transmission engaged.

An Experienced Hough Distributor is ready to give you all the facts about the H-120 PAYLOADER and the D-120 PAYDOZER and how their convertibility can save you thousands of dollars in equipment costs.

THE FRANK G. HOUGH CO.
705 Sunnyside Ave., Libertyville, Ill.
Send data on the D-120 PAYDOZER
and H-120 PAYLOADER conversion.

Name _____
Title _____
Company _____
Street _____
City _____ State _____

6-B-1



THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS

SUBSIDIARY - INTERNATIONAL HARVESTER COMPANY



HOUGH, PAYLOADER, PAYMOVER, PAYLOGGER, PAYLOMATIC and
PAY are registered trademark names of The Frank G. Hough Co.

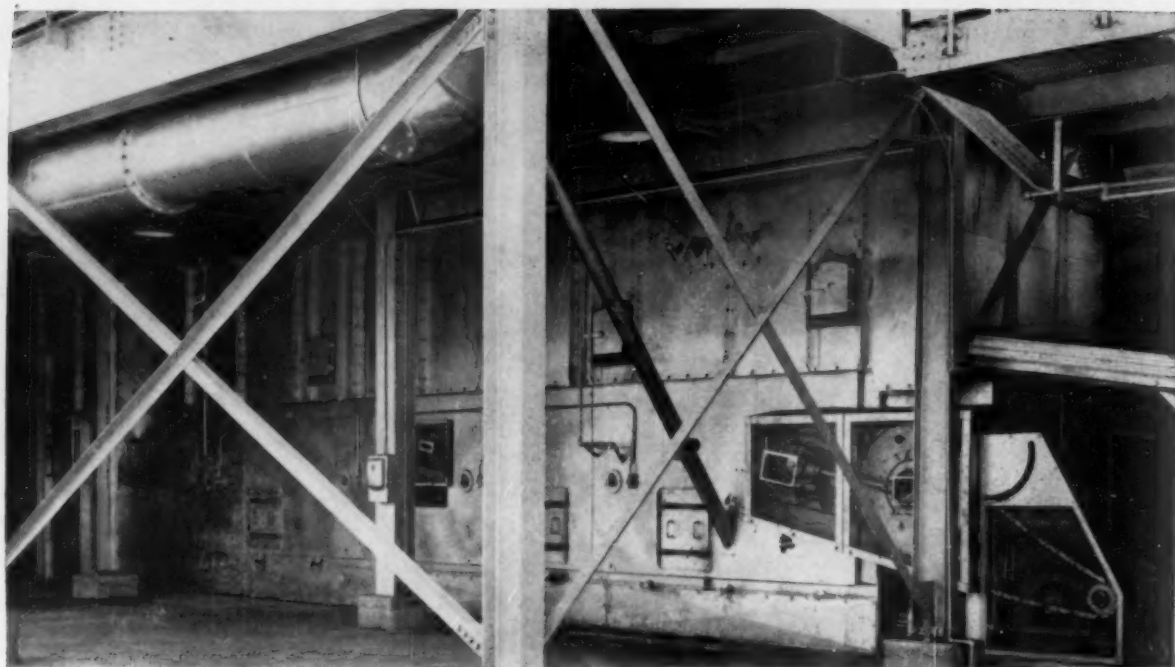
®

HOUGH

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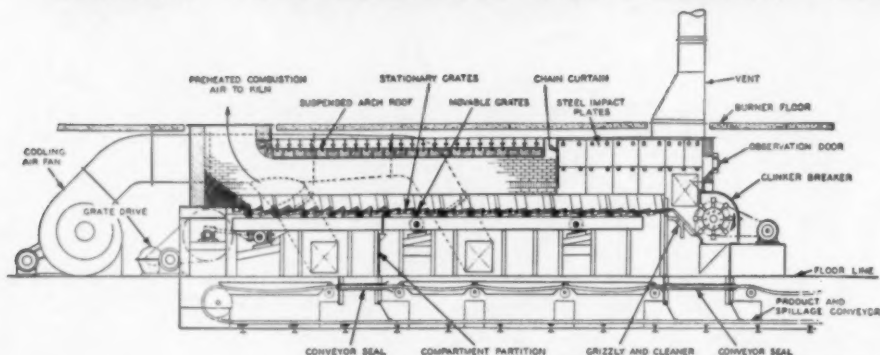


PAYDOZER®



Side View from feed end of a 7' x 44' Horizontal-Grate Cooler, designed for cooling 4,000 barrels of Portland cement clinker per day, showing crank type grate drive.

Fuller HORIZONTAL-Grate Cooler



Cross-section drawing showing construction and arrangement of a typical Horizontal-Grate Cooler with clinker breaker.

Compact . . . Economical . . . Fast-cooling. Already proven in use, the compact, efficient design of Fuller's new Horizontal-Grate Cooler promises savings for many plants. It's an ideal choice where headroom is at a minimum . . . where a short, compact unit is desired.

Like the famous Fuller Inclined-Grate Cooler, the new Horizontal-Grate type is meeting with wide acceptance. One of the new units, already in operation, is shown above.

A Fuller Horizontal-Grate Cooler or an Inclined-Grate unit is the right answer to your cooling needs. Fuller coolers are used

for a wide range of materials including lime, dolomite, cement clinker, iron nodules, phosphate nodules, sinter, ores, and others. Fuller sales engineers will be glad to discuss your cooling problems and make recommendations for your plant—without obligation, of course.

Features of the Fuller HORIZONTAL-Grate Cooler

Requires a minimum of headroom
Short length if necessary
Better secondary air temperature control
Less refractories

Less installation time
More rapid clinker distribution
More uniform bed thickness
Improved recuperation and cooling



FULLER COMPANY

102 Bridge St., Catasauqua, Pa.
Subsidiary of General American Transportation Corporation
Offices in Principal Cities Throughout the World

4578

CO-38

"See Chemical Engineering Catalog for details and specifications".

Enter 1229 on Reader Card

HINTS & HELPS

Profit-making ideas developed by operating men



Euclid backscratcher cleans gumbo from truck bodies

A South American producer has developed this technique for keeping the bottoms of his dump trucks clean. Buildup occurs particularly during the rainy season, but it can happen anytime.

The pipe framework is securely welded to an older truck that otherwise might have been

scrapped. A cutting blade has half a dozen discarded dipper teeth welded to it. When the weight of the body is added to the weight of the pipe framework, there is plenty of weight to peel off the toughest accumulation of compacted material.

Harry Hess, Houston 33, Texas

Reefer cars keep on working, regardless of age

A western sand and gravel producer has put a fleet of old refrigerator cars to work again after their careers on the railroad ended. He was able to purchase a number of these derelicts for \$50 each from a scrap dealer who had removed the wheels, axles and metal substructure from each car. The insulation, heavy doors and maple lining were left intact.

One particularly sturdy car was selected to be an office building. What it lacks in window

space, it more than makes up for in comfort when the air conditioning is needed. Then, too, it is strong and can be secured to prevent the entry of all but the most dedicated safe crackers.

Security led to the selection of another of these cars for a small tool storage and machine shop. During the day, the doors on both sides provide plenty of air and light. At night, they can be closed and bolted to prevent access to tools and equipment.

Maintenance supplies are

stored in a battery of these old cars that are mounted in series on concrete piers. Heavy equipment can be trundled up a concrete ramp into the cars, and the heavy floors can support a great deal of weight. The wooden



sheathing provides ideal support for bins, shelves and hooks, which are needed to take care of the hundreds of items of all shapes and sizes used in a sand and gravel processing plant.

Tank car tricks

Western aggregates producers have discovered advantages in discarded tank cars. With one end cut out and the dome removed, a tank car makes an ideal reclaim tunnel. Of course, there is no reason why more than one opening cannot be cut into the top to put in extra reclaim gates or feeders. Nor is there usually any good reason why more than one tank can't be lined up to make a tunnel as long as desirable under stockpiles of aggregates. There is one major hazard. Tank cars that have been used to carry petroleum products, tallow and chemicals may have flammable, explosive or poisonous residues which will be activated when the tank is cut.

Please turn to page 80

Hints & Helps

continued from page 79

Patrol dogs

Dogs may be man's best friend, yet they do yeoman duty as employees in a number of western rock products producers' plants. Many an installation is too huge to enclose in a man-fence, yet there is enough valuable machinery to make an attractive lure

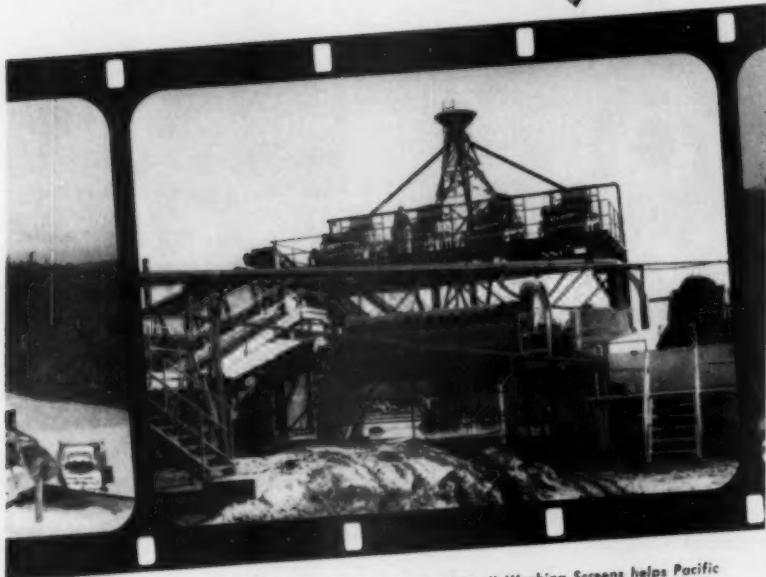
for trespassers or children. Watchdogs provide a great deal of protection for these plants for very low cost. They can cover a great deal of ground, they are just as effective at night as during the day, command a lot of respect from potential vandals and don't cost a lot to feed and house.

English producer sets record for steep conveyor

An English producer has taken advantage of a German development in conveyor design to achieve belt conveyor efficiency on steep inclines up to 60 deg.

This is done with a conventional belt conveyor. But the secret of the success is a traveling mat of chain links that hold materi-

Screen Story...



A battery of four 4' x 10' Three-Pocket "Step" Washing Screens helps Pacific Clay Products turn out a high quality glass sand at Comanche, California. In this difficult, high-abrasion service with a large percentage of oversize in the feed, Overstrom Vibrating Screens get maximum life from expensive 30-mesh slotted cloth while efficiently removing undersize.

Better plants producing better products with *Overstrom Vibrating Screens* — that's a familiar scene in the non-metallic minerals industry.

With their versatile, time-proven Two-Bearing Cartridge Vibrators, Overstrom screens can operate at high speeds and low amplitudes for fine mesh screening, wet or dry — or at lower speeds and large amplitudes for coarse screening or scalping. Field adjustments of speeds and amplitudes can be quickly made to meet new conditions with peak efficiency. Oil-bath lubrication assures longest bearing life under all conditions of speed and load.

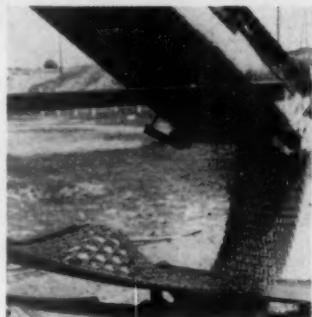
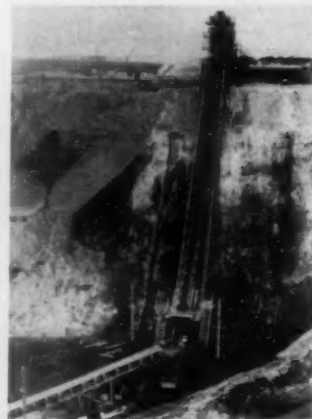
(write for catalog and pictorial case histories)

OVERSTROM

VIBRATING SCREENS

OVERSTROM & SONS, INC. • Dallas, Texas • Alhambra, California • USA
address inquiries to: 2213 West Mission Road, Alhambra, California

Enter 1254 on Reader Card



als in place on the belt. The chain links are very dense and very flexible—the weight of the mass of links holds granular materials in place while the flexible links conform to the contour of the burden.

Material is loaded on the belt on a flat or near-horizontal section. Once in place, the endless, traveling chain belt is laid in place. Since it is moving at the same speed as the belt conveyor, there is no relative movement to disturb the material.

Please turn to page 83

At National Lime and Stone Company

New steels are
born at
Armco

ARMCO LINER PLATE

protects men and equipment from falling rocks



Strong,
Economical,
Durable

To gain access to a new limestone source, National Lime and Stone Company, Lima, Ohio, first had to carve a tunnel through solid limestone under a railway roadbed. Due to stratafaciation characteristics of this formation, chunks of limestone would occasionally loosen and fall into the tunnel.

To provide economical protection, company officials chose an arched lining of Armco Liner Plate, 325½' long, 13' 1½" high and 16' ½" wide at the base. Traffic was maintained through the tunnel while an Armco Construction Crew installed the protective lining, made from seven-gage galvanized steel.

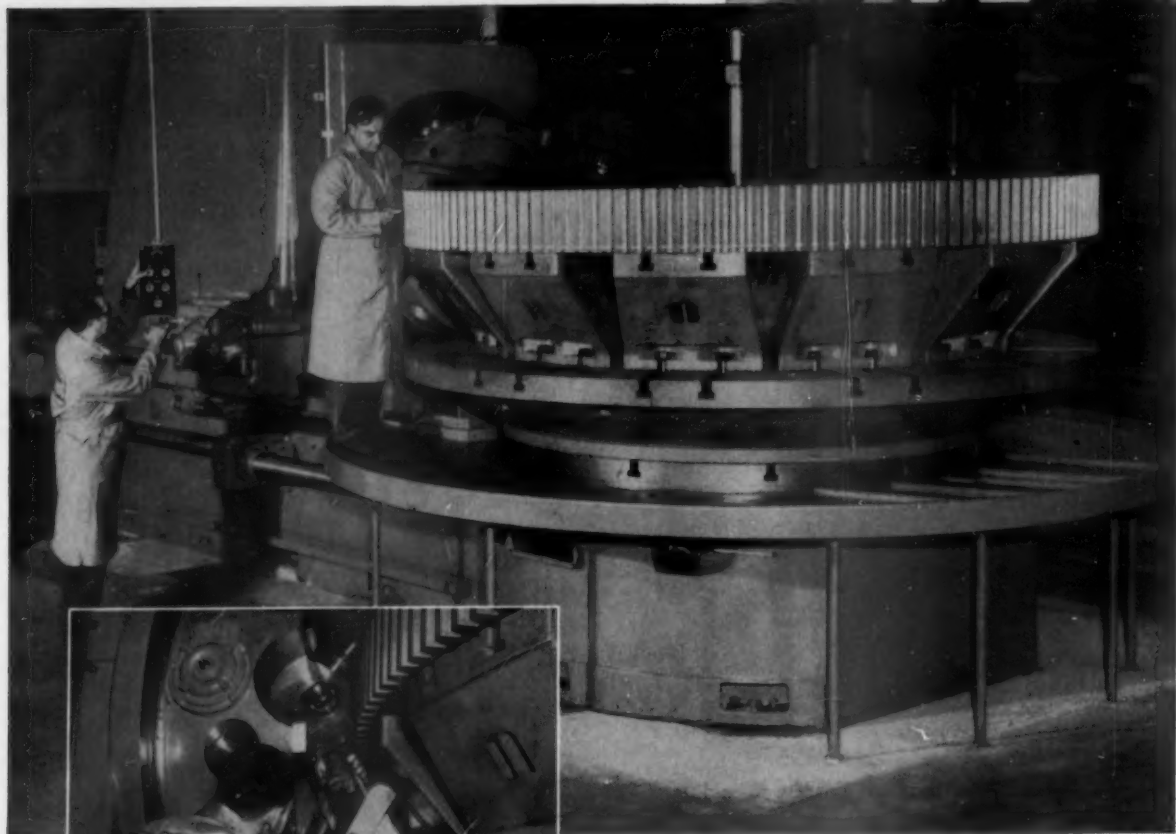
This is just one way Armco Liner Plate serves the quarry industry. All over the country, quarry operators choose Armco Liner Plate for reclaiming tunnels and aggregate bins. The reasons? It's economical, easy to install and requires *no maintenance*.

For data, call or write Armco Drainage & Metal Products, Inc., 6551 Curtis Street, Middletown, Ohio.



ARMCO Drainage & Metal Products

**"Had to have extremely close
tolerances...so I called
Phillie Gear"**



Phillie Gear's new hobber at work . . . will handle gears up to 165" dia., 64" face width.

Looking for commercial gearing, cut to exceptionally close tolerances . . . at no increase in cost? Then give us a call. We are equipped better than ever before to meet your needs with the highest quality commercial gearing available today. This new hobber, the latest addition to our new and expanded facilities, is the machine that can

turn out the big ones. It is the most rugged, precise gear hobber we've ever seen. It was custom built to our rigid specifications. Accuracy is certified to ten arc seconds.

Whatever your gearing requirement, our engineering staff is ready to work with you in finding a better solution to your gearing problems. And engineering is backed by the newest, most comprehensive production facilities in the industry.



For complete data, write on your company letterhead for our gearing catalog G-127.

phillie gear®

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PHILADELPHIA GEAR CORPORATION
King of Prussia (Suburban Philadelphia), Pennsylvania



ERIEZ Magnetic Minute

60 seconds that will help you improve operating efficiency.



FEEDS THE BIG STUFF WITH ACCURATE CONTROL

AC powered Eriez Hi-Vi Vibratory Feeders move large tonnages of bulk materials with accurate control . . . more efficiently and economically. Illustration shows one of a number of Eriez units available for heavy feeding applications where big capacity and accuracy are essential.

Whatever your application, there is an Eriez electro-permanent magnetic feeder that will meet your exact needs. And you get this exclusive combination of advantages: No rectifier needed . . . AC operation. Totally enclosed drive element ideal for hazardous, dusty, wet and corrosive installations. New fibre glass springs assure superior performance and control . . . longer life because spring breakage is practically eliminated.

The full line of Eriez Hi-Vi vibratory feeders includes models with feeding capacities ranging from ounces to many tons per hour.

Write for descriptive bulletin to:

ERIEZ MANUFACTURING CO.

202TA Magnet Drive, Erie, Pa.



MAGNA-THOUGHT

Constant research, development and refinement are the keys to new and improved products. New and improved products are the keys to a company's growth.

A. F. Israelson

A. F. ISRAELSON
Chief Engineer



A GROWTH COMPANY . . .
10 NEW PRODUCTS IN THE LAST 5 YEARS

Enter 1255 on Reader Card

Hints & Helps

continued from page 80

Reclaimed railroad cars

Antiquated rolling stock seems to be a drug on the market in some parts of the country, especially when the scrap market won't repay the cost of removing the heavy undercarriages. But when the rest of the car is too battered to salvage, these fabricated structures often have plenty of useful life for other uses.

Western rock products producers have discovered this fact. A number of them with gullies or dry stream beds across their properties have found that it pays to bridge their miniature ravines with these structures. Each steel frame is between 30 and 40 ft. long and slightly wider than necessary to support a truck. Each is supported by concrete piers or rock-filled cribs made from railroad ties.

If these temporary bridges are washed out, they may be quickly and inexpensively replaced. If the haul road must be relocated, the bridges can be picked up and moved, too. Of course, if the transfer is too long or too costly, the bridges can be sold as scrap or abandoned without great loss.

Clay crusher

Hard clays and shales can try the patience and ingenuity of the most experienced sand and gravel producer. When wet, clay balls are hard and dense; when dry, they tend to break down and coat the good aggregates with an impervious film of dust.

A midwestern producer attacked this problem with a double roll crusher whose rolls are covered with rubber. The rubber is hard enough to break down the clay yet resilient enough not to crush the sand or fine gravel. In addition, the rubber wears out very slowly compared with exposed metal rolls.

END

ROCK PRODUCTS, June, 1961



ERIEZ Magnetic Minute

60 seconds that will help you improve operating efficiency.



How much will an ERIEZ PERMANENT MAGNETIC PULLEY save you?

Erium® powered Eriez magnetic pulleys save one firm \$1200 a year by removing 50 pounds of tramp iron a week from coarse clay. They can save you as much—or more, depending on your application. In addition to preventing machinery damage, Eriez permanent magnetic pulleys prevent fires and explosions; assure product quality.

The pulley illustrated is one of 192 sizes (up to 36" diameter in any belt width) made by Eriez. There is one for your exact application. Two basic models are available: Type AA, ideal for separating small and medium tramp iron and fine ferrous contamination; Type CR, which performs best in removing large pieces of tramp iron.

All models are engineered and constructed to give you the finest in automatic separation. All are powered by Erium®—our exclusively-designed power source. Model for model, Eriez units give you the finest quality and consistency of magnetic strength.

For descriptive bulletin write to:

ERIEZ MANUFACTURING CO.

202TB Magnet Drive, Erie, Pa.



MAGNA-THOUGHT

We willingly share our design and application know-how to help our customers find new ways to improve their plant efficiency and product quality.

E. J. Tenpas

E. J. TENPAS
Supervisor,
Magnetic Engineering



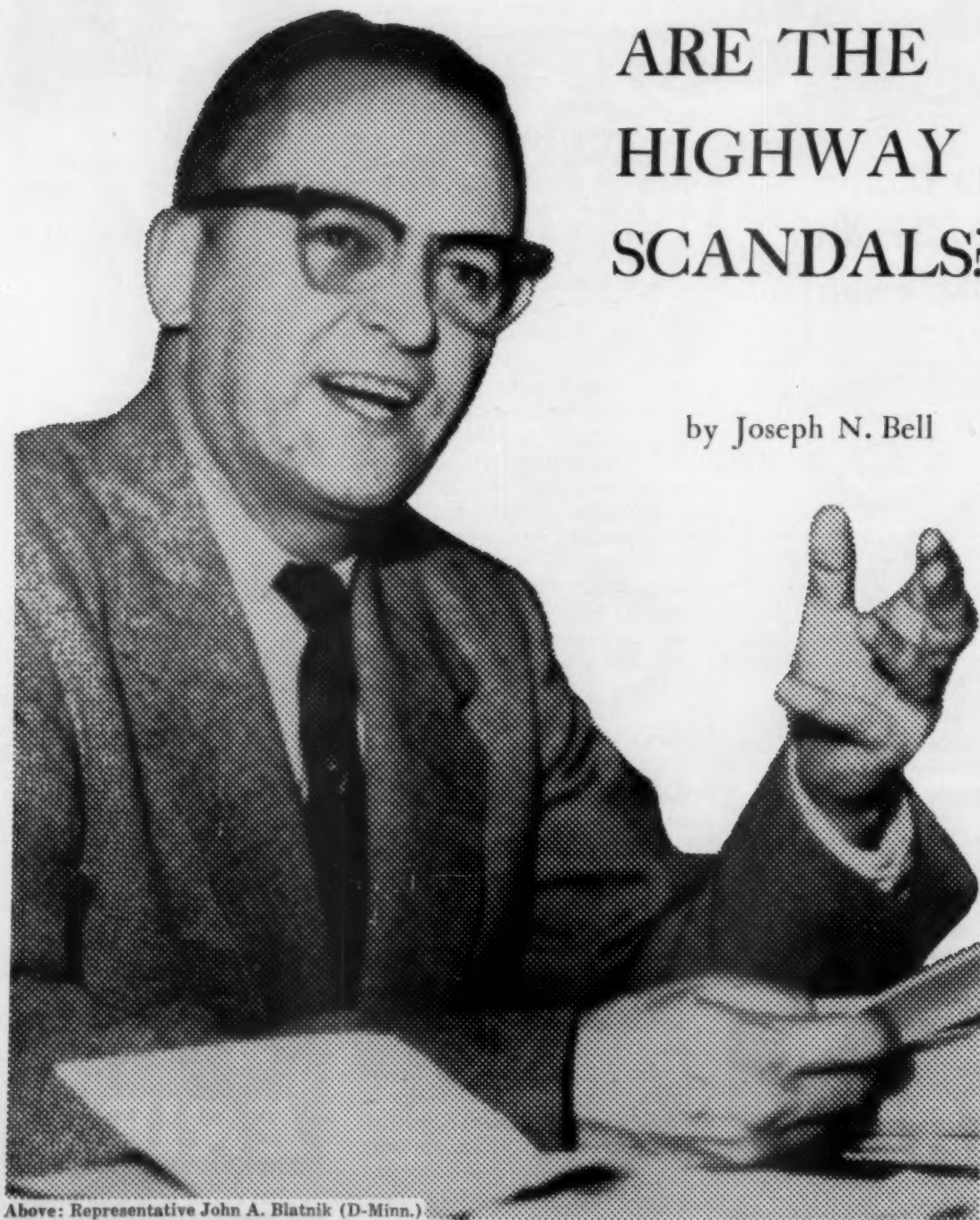
A GROWTH COMPANY . . .
10 NEW PRODUCTS IN THE LAST 5 YEARS

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June 1961

HOW SERIOUS ARE THE HIGHWAY SCANDALS?

by Joseph N. Bell



Above: Representative John A. Blatnik (D-Minn.)

Here's the record developed by Congressman Blatnik's Special Subcommittee

PUBLIC WRATH has been vigorously kindled by scandals brought to light in recent Interstate Highway System investigations. And of course the press, for better or for worse, has been a potent igniting factor.

But it would so far appear that the scandal in the highway program is more one of bad ethics than graft, and that the bad ethics are concentrated primarily among a limited number of contractors—who have been doing this sort of thing for years and feel that they have to in order to compete for jobs—and a coterie of non-professional state employees.

But let's allow Congressional investigators and "bad actors" alike to speak for themselves.

THE SCENE: A hearing room, the House of Representatives, Washington, D.C.

CAST OF CHARACTERS: Special Subcommittee on the Federal Aid Highway Program, including Rep. John A. Blatnik (D., Minn.); Rep. William C. Cramer (R., Fla.); Rep. Gordon H. Scherer (R., Ohio); W. A. May, Chief Counsel; G. M. Kopecky, Chief Investigator

Officials of the XYZ Contracting Co., including Mr. X, president; Mr. B, bookkeeper; Mr. Y, general superintendent; Mr. Z, assistant superintendent

Mr. A, president of the ABC Contracting Co.

Employees of the Florida State Highway Department, including Resident Engineers F and H

Al C. Church, State Highway Engineer

SCENE 1

MR. BLATNIK: The meeting will please come to order. We are now in public session of the Special Subcommittee on the Federal Aid Highway Program of the House Public Works Committee.

We start this series of hearings in pursuance of the directives which established the committee and directed it to make certain investigations of matters in which federal funds are involved in highway projects carried out throughout this country.

In hearings held earlier this year, the subcommittee devoted its attention to the adequacy of controls being exercised at both the state and federal levels over highway construction.

We inquired into a situation in Oklahoma involving a section of the Interstate System known as the Skelly Bypass, located in Tulsa.

The testimony established that there were gross deficiencies in inspection and testing procedures that permitted the contractor to build projects that failed to meet specifications. As a result of these disclosures, both the state and the Bureau of Public Roads immediately initiated reforms.

*This is the third in a series of four articles dealing with the Federal-Aid Highway Program; see, also, Part 1, *Will Congress resolve money troubles on the interstate system?* and Part 2, *Road program roulette*, in the April and May 1961 issues of *ROCK PRODUCTS*, pages 80 and 95

Federal-aid highways are built through a partnership arrangement between the states and the federal government. The Bureau of Public Roads has a responsibility to make periodic inspections during the course of construction of the more important highways and to make a final inspection before approval and acceptance of the completed project.

However, the responsibility for the day-to-day supervision of the construction rests with the state.

Here, the responsibility of the state comes into sharp focus. The federal government must have every assurance that the state is staffing highway projects being built with federal aid with personnel having both the capability and fortitude to enforce specifications and contract provisions.

Any demonstrated weakness at this critical point has a deleterious effect on the entire program. It is at this particular stage that both the federal government and the state either do, or do not, get proper return for the money invested.

Safeguards are essential to prevent the intrusion of factors likely to sway the free exercise of proper judgment by those whose duty it is to supervise effectively any and all stages of construction.

SCENE 2

MR. MAY: As a result of your investigation, could you briefly describe the work and dollar volume of business that the XYZ Contracting Co. has done recently in the state of Florida?

MR. KOPECKY: Since January 1, 1956, it has had a total in road contracts of \$26,249,271.80 as prime contractor. In addition, it has served as a subcontractor to other prime contractors and, since January 1, 1958, it has had subcontracts totaling \$4,103,172.11, for a total roadbuilding sum of contracts, as a prime contractor and subcontractor, of \$30,352,443.91.

SCENE 3

MR. MAY: Mr. B, were you formerly employed by the XYZ Contracting Co.?

MR. B: Yes, sir.

MR. MAY: When did you go to work for them?

MR. B: August 1953.

MR. MAY: We learned that it was the practice of the company to mail out cash to various state road department engineers. Do you have any idea when that practice began, Mr. B?

MR. B: It was in existence, sir, when I got there.

MR. MAY: In 1953?

MR. B: Yes, sir.

MR. MAY: Was it being carried on in the same fashion?

MR. B: Yes, sir.

SCENE 4

MR. BLATNIK: What, in your mind, would be the reason for these amounts of payments and loans and gifts as part of a regular policy by contractors?

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RES. ENG. F: It is more or less customary in Florida, and has been ever since I have been with the department, for the contractors because of the low rates of pay of the men and the long hours they have had to work. It has been customary, as long as I can remember, for the contractors to give the engineers gifts throughout the year.

MR. BLATNIK: It has been customary, but what is the reason for it?

RES. ENG. F: Well, if I were a contractor, which I have been in the past, I would state that it was given to those engineers who took more interest in the work and, in a lot of instances, used preventive engineering to keep their foremen and superintendents from doing something that was not right on the job, that—

MR. BLATNIK: Aren't those your regular normal duties as state engineer?

RES. ENG. F: That is correct. But some of us were over-zealous; in other words, some of us took more pride in our work, we worked longer hours, and we were available for anything that would come up.

SCENE 5

MR. MAY: I would like to read the following deposition into the record:

I, a resident of Florida, make the following statement to James P. Kelly, an investigator for the Special Subcommittee on the Federal Aid Highway Program.

I have been regularly employed by the State Road Department of the State of Florida and am now resident engineer at — Florida.

In March 1959, I had a conversation with Mr. Y, a general superintendent of XYZ Contracting Co. Mr. Y wanted to express appreciation for help I had given to XYZ. He at first suggested helping me with my moving but I declined. Mr. Y then suggested that I tell him what I wanted or could use in the form of appliances, and I mentioned an automobile radio, since I had four counties to cover in my new job. He told me to go to any place that sold and installed radios and have them bill XYZ Contracting Co. The bill, which amounted to \$52.00, was sent to XYZ. I had the radio installed in the 1959 Chevrolet which was given to me by the State Road Department and which I use for official business.

In December 1959, I received a Christmas Card from XYZ, which contained approximately \$25.00.

On numerous occasions I have gone to dinner with representatives of various contracting companies as their guest. This, I believe, is a common practice in this industry.

SCENE 6

MR. MAY: Mr. H, I will attempt to clarify the record.

If you listen very carefully to me, when I am finished, if I have made an error, you tell me about it.

Is this the situation? These projects started, people working under you did some work for the contractor, and the contractor's representative told you that he was going to send you something to buy some whisky for the boys. Beginning in February of 1957, you began to receive, weekly, \$25.

There came a point when you were having to watch the contractors' work much too closely to your satis-

faction. You had to pay too close attention to the bearings, the contractor was getting something on the piles he was driving. There was such a thing as watching the quality of the material being sent for stabilizing, and sometimes, although the work might meet specifications, it did not meet your satisfaction.

You then decided that the money being sent to you was in too great an amount for the services that had been rendered, you came to the conclusion that the contractor was looking for something extra for the money, and you sent the money back.

RES. ENG. H: Yes, sir.

MR. MAY: All this is true?

RES. ENG. H: Yes, sir.

MR. MAY: Now thereafter, you had a conversation with Mr. Y, who was general superintendent.

RES. ENG. H: Yes, sir.

MR. MAY: He asked you why you sent the money back and you said, "I sent the money back because I came to the conclusion that you are trying to buy me and I will have no part of it"—is that true?

RES. ENG. H: Something similar to that effect.

MR. MAY: That was the impression you were trying to leave with Mr. Y?

RES. ENG. H: Yes, sir.

SCENE 7

MR. MAY: Did you occasionally give some state road department personnel \$5?

MR. Z: No, sir, that would be an insult.

MR. MAY: Insult. Does it have to be \$25?

MR. Z: Evidently, yes, sir.

MR. MAY: Have you ever given any money to a state road department employee?

MR. Z: Well, I have, but there is an explanation to go with that. It has been customary that the contractor take care of the opposite side, more or less, pick up their tabs. All these years—

MR. BLATNIK: What do you mean by "opposite side," Mr. Z?

MR. Z: If we work for the city, we take care of city engineers. If we work for the county, we take care of the county. If we work for the state, we take care of the state engineers.

MR. MAY: What do you mean by "take care"?

MR. Z: Like pick up the little tabs and carry them to lunch, and once in a while, buy them a dinner, and things like that.

MR. BLATNIK: What other things? Do you buy anything besides meals? Do you buy them gifts?

MR. Z: Christmas time, you give them nice gifts of turkeys, hams and, of course, most everybody likes their Christmas spirits, and you supply them with a certain amount of that.

MR. MAY: Do you supply these Christmas spirits throughout the year?

MR. Z: Well, occasionally, yes, sir.

MR. CRAMER: Hadn't the state engineers been cooperating with you and working with you consistent with their duties?

MR. Z: Yes. Most of them had and we had been giving them gifts in appreciation for this in the form of whiskey; in the form of other gifts, Christmastime.

MR. CRAMER: Was it your opinion you wouldn't con-

tinue to get this cooperation if you didn't provide them with gratuities, and so forth? It seems to me to be a fairly serious indictment of the road board employees to indicate that your reason for giving them that was to get them to cooperate with you. Is it on the basis you didn't get cooperation before, or you had trouble with them, or what?

MR. Z: No, but let me say, Congressman, that building a road job is a tremendous undertaking.

MR. CRAMER: I realize that.

MR. Z: It requires a lot of cooperation and coordination on the part of state road department people, and for them just to be there as a body and give certain orders doesn't get the job done. In other words, they could all perform their jobs and probably get no criticism and yet not be out there pushing that job. That's the difference.

MR. CRAMER: You gave it to them to get their full cooperation and to get them to push the job, so that you could meet your contract. Is that right?

MR. Z: Absolutely.

MR. SCHERER: All engineers didn't get it even though you had a job in progress, did they?

MR. Z: That's right. The engineer had to be in a position to coordinate and expedite.

MR. SCHERER: You realized that there were some engineers that had jurisdiction over one of your jobs or some of your jobs that wouldn't take the money, didn't you?

MR. Z: Yes.

MR. SCHERER: You evaluated your engineers on that basis?

MR. Z: Yes.

MR. MAY: Would these payments amount to a reward for the state engineers?

MR. Z: Yes. I suppose you could call it a reward. We certainly intended to compensate them.

MR. MAY: Could it be considered an incentive?

MR. Z: I suppose, yes.

MR. MAY: Was the avoidance of delay a criterion that entered into the determination of this?

MR. Z: Very definitely.

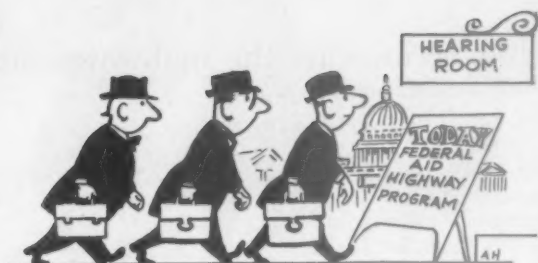
MR. CRAMER: Do you think this is a good practice for the companies doing business with the state, to have to compensate state employees to get them to do the job they are supposed to do anyway?

MR. Z: We would rather not. If the point came that I was not getting what I needed—let's say I did have a man who was just there in body, it would be worth it to the contractor for me to go out and hire a survey crew, and we have had our own men to put stakes because the state road people didn't have enough personnel to put the work out in front of us.

SCENE 8

MR. CRAMER: Mr. X, the thing that I have difficulty in grasping is how these people were supposed to expedite your work for you if they did not know the money came from you? Your position is that you were making this money available to them to expedite your work so you could prevent stoppages. I can understand that reasoning, although I don't agree with you.

But how does that follow that you did it in a way that supposedly a lot of these people say they don't



even know it was coming from you—how are you getting any expedition out of them?

MR. X: Mr. Cramer, it is our opinion that the men did know the money was coming from us.

SCENE 9

MR. MAY: Mr. A, you have been in the road construction business for some 54 years. At various times your company has performed work in Florida, Georgia, Mississippi, Tennessee, North & South Carolina and Alabama.

MR. A: Yes, sir.

MR. MAY: Mr. A, we have had considerable testimony thus far in these hearings with respect to loans from contractors to state road department personnel. We have had some testimony that the contractors making these alleged loans did not expect repayment. Is that a fair statement to make with respect to your company?

MR. Z: I would say "Yes" to that, in a majority of cases.

MR. MAY: Thank you. Mr. A, the practice of giving things to state road department people by the contractors has been a practice that has existed over many years. Is that true?

MR. A: We have. I don't know about others.

MR. MAY: We spoke with you last evening and you mentioned that this practice has sort of snowballed over the years. Could you explain that?

MR. A: I imagine an explanation could be started off like this, in that now we do larger jobs and become closer and friendlier and more acquainted with our own personnel and engineers and suppliers of our various materials, and the lists—the so-called lists that are referred to so many times—they are lists more or less in your mind. Well, one of the superintendents says, "Now I want to be sure that John Doe has some fruit next Christmas." And the fruit list and fruit thinking has been expanded along with other items.

SCENE 10

MR. SCHERER: Isn't this a general practice, or hasn't it been a general practice in Florida on the part of contractors other than you, to do this same thing?

MR. Y: I do not know that giving out weekly payments is a practice. No, I do not know that it is.

MR. MAY: Mr. Y, when you discussed the matter with Mr. X, were you in favor of this decision?

MR. Y: In the past we had been doing what I think most of the other contractors were doing—passing out whisky as gifts for appreciation for work that was done. Or it has been the standard practice, as long as I have been in the trade, to pick up the meal tabs at any time that we were around the state road department people. It has been a practice to entertain them and this was just a change in the policy with us.

MR. MAY: Mr. Kopecky, how many state road depart-

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ment engineers were receiving these regular weekly payments from the XYZ Contracting Co.? Just the regular weekly payments?

MR. KOPECKY: Sixteen.

MR. MAY: Didn't the practice continue with respect to whisky, and lunches, and other items to other engineers in the state road department?

MR. Y: The practice continued as far as lunches; but as far as whisky itself was concerned, we keep a certain amount of whisky on hand at all times, and orders were issued by me to the man in charge of this whisky that no supervisor under me would be able to check out any more whisky.

MR. MAY: We are very concerned about the practices of state people receiving things of value from a contractor; someone might wonder if the state people could then exercise their free judgment in the period thereafter; having become obligated to the contractor, how can they exercise their free judgment when it comes to accepting work?

MR. Y: Well, in my opinion, and the way I see that, that should have no bearing whatsoever on it.

MR. MAY: Do you think maybe sometimes it does?

MR. Y: No, sir, I wouldn't say that. I just wouldn't say that, because it has never been shown to me.

MR. CRAMER: Do you think it is a proper practice for you to employ state employees in their off-hours? Do you think it is a good practice?

MR. Y: I am obligated to my company to do the best job I possibly can—to construct the job out there that would be "A No. 1" in anybody's book, as quickly and as cheaply as I possibly can. As long as I didn't engage in anything that I thought was faulty, I would employ many different things to get this accomplished.

MR. CRAMER: Do you think it is a good practice to pay these \$25 a week payments?

MR. Y: I would rather not have to do it that way.

MR. CRAMER: What do you think the solution is in order to get it? As I say, it appears to me you made a pretty serious indictment against some of the state road department employees concerning their unwillingness to give a maximum effort without some additional inducement. What is the answer? Certainly you can't condone giving inducements of your own on the part of somebody doing business with the state, to state employees. This committee is interested in what should be done to prevent this happening in the future. What do you think the answer is?

MR. Y: I wish I could make some constructive suggestions along those lines. That's a point I am sure is going to take a lot of talking about.

MR. CRAMER: You do business with the state. What administratively on the state level could be done?

MR. Y: I think you are going to probably have to increase the income of the engineers. You are going to have to try to get men—I shouldn't say men who are better qualified. Every man here that you have heard is very well qualified. But I think you are going to increase their pay so that you can induce other engineers to come along, and so you will have good engineers when these fellows are retired.

MR. SCHERER: How have your highways stood up compared to those built by other contractors?

MR. Y: We think that our roads stand up equally as well, or better than any contractor in the state of Florida.

MR. SCHERER: Have you ever had any serious complaints, or have there ever been any other investigations of XYZ over the years as a result of pavement or structural failures?

MR. Y: No, sir. We have never, to my knowledge, since I have been with the company, had any structural failure of any kind. We have been striving to make the name of XYZ synonymous with quality, and we think chopping a little bit of depth and stabilization, and some of those things, would be more expensive to try to get by with than it would be to get something extra in a lot of cases.

MR. SCHERER: To your knowledge—I said this same thing to the engineers of the state road department who were under oath—to your knowledge do you know of any material deviation from specifications on your road construction projects, say, in the last 5 years?

MR. Y: No, sir, I do not.

MR. MAY: Did Mr. Al Church, who is state highway engineer, ever receive or accept anything from you?

MR. Y: No, sir. And I remember on one occasion we sent him a present of cash and he returned it.

MR. MAY: I think it is significant there are apparently still many fine engineers in the state of Florida and I am sure throughout the country.

SCENE 11

MR. CHURCH: I believe I can give a rather rambling explanation of it. We didn't have this problem before the war in the 10-odd years I worked with the road department. There was very little gratuity business at all at Christmastime or any other time. I don't believe I had a total of three meals furnished me by contractors while I was pursuing my duties as a road man, instrument man, inspector or project engineer. After we returned to the road department, when the war was finished, this practice still, as is now being discussed, was not prevalent; but as Mr. X pointed out, it began to accelerate, and I personally feel that part of it was brought about by the fact that income-tax structures allowed certain deductions for this. And first one contractor would do a little something for the engineers, and then another one, in order to keep pace, would do a little something, and he maybe would go a little further. And, I think in the meantime, I was transferred from the field as a project engineer, in 1947, to Tallahassee, and I went into an ivory tower.

I lost contact with the field. Our district engineers promoted up to those jobs had such a work program



with this increased federal-aid money in the Interstate that they lost contact. They became engineering executives, just working constantly to get this program on the road. And we assumed that everybody in our organization was basically honest, and we assumed the same thing for the contractors. And I never dreamed that any of my men would be putting the bite, so to speak, on contractors for loans in the manner that testimony has disclosed here.

MR. MAY: Did there exist some weakness in your organization memos in this regard?

MR. CHURCH: We never touched on this phase. We assumed that people would police their own morals and that any man who had any conscience at all would not ask a contractor for a loan. Unless I could excuse an occasional extreme emergency loan. I know contractors are just naturally generous. They have to be by virtue of the work they are in. They battle the elements, and they recognize chance, and they are a little on the liberal side by nature.

MR. MAY: Mr. Church, as a result of this investigation, has there been some other tightening up done by the states and/or the federal government?

MR. CHURCH: Yes, sir, we have jumped in to close the gaps that have been developed in every area. I can talk about what we have done in the matter of soil-sampling procedures that we are working on constantly. We profit by all of these points that are brought to our attention.

The Bureau of Public Roads has put some policing powers into their field people and these are helping us to police the work.

MR. MAY: Do you have a copy of a letter put out by the road department, November 23 of this year. I wonder if you would read that for the record, Mr. Church.

MR. CHURCH: This is a very brief memorandum form letter from the present chairman of the road department to contractors, dealers and suppliers:

"At a recent meeting, the road board adopted the policy that no member or employe of the department may accept any gift, gratuity, loan or other benefit from persons or firms with whom they have road department business contracts.

"This policy applies, of course, to Christmas remembrances. I know that in years past, many of you have sent such remembrances to department officials and employes. And I know that such gifts were accepted in the same proper spirit in which they were offered.

The policy may seem severe to you, but the board felt that this action was desirable under all of the circumstances bearing on the matter.

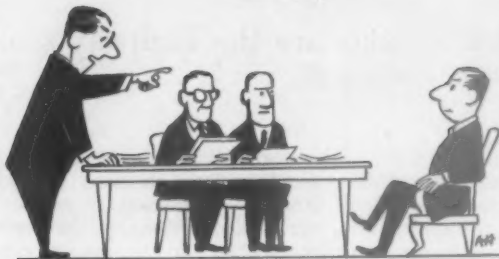
To help implement our policy, we ask your cooperation by discontinuing any practices of sending gifts to our officials and employes at any time.

Sincerely, William B. Killian, Chairman"

SCENE 12

MR. BLATNIK: The Chair has a concluding statement to read. During six days of hearings, the members of this subcommittee have listened to testimony with most disturbing implications.

We have seen spread on the record before this subcommittee the admission that many Florida State Road



Department engineers accepted thousands of dollars, in one form or another, from contractors whose work they were supposed to be supervising.

These contractors have admitted that they paid out this money, either through the devious method of sending specified weekly sums in unmarked envelopes through the mail, or by making loans they had good reason to believe would never be repaid, or by the purchase of a wide variety of items which later were given to state personnel.

This subcommittee has been told that these practices have been prevalent for years, and one contractor testified that such practices have snowballed from what they used to be.

The state road department employees who received this money insisted uniformly that the tender by the contractors, and the acceptance by them, in no way influenced their judgment in the conduct of their daily duties.

The various contractors who testified here maintained uniformly that the disbursements in this fashion were not for the purpose of inducing state employees to approve substandard construction but were intended to "expedite" the progress of the work.

The Chair finds it difficult in the light of all the testimony to believe that the conditions prevailed without involvement of a quid pro quo, whatever its nature might have been.

As the Chair observed during the course of the hearings, the relationship shown to have existed between the state employees and the contractors appears to be rooted in a gray area, and is susceptible of several interpretations.

One interpretation suggests that some state employees came perilously close to the possibility of extortion. Still another interpretation which the record might well sustain is the possibility that the contractors may have approached the stage of bribery or attempted bribery.

Viewed in the most charitable light, the testimony readily supports the conclusion that the gratuities, no matter what form they might have assumed, put the state employees definitely under obligation to the contractors. Conversely, any demand by the state employees for money, either as a gift or loan, placed a contractor in the position of being reluctant to refuse for fear that such refusal would promote complications during the progress of the project.

Various members of the subcommittee, including the Chair, during the course of the hearings, have expressed the opinion for the record that these practices are reprehensible, that they cannot be condoned, and that they must be stopped.

MR. SCHERER: There are many forces throughout this country opposing the continuation of this program, at least at its present level, and such testimony as is produced here and such conduct as has been en-

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gaged in by the contractors and the people of the state road department, not only reflects on many dedicated highway engineers throughout the country and many honest contractors, but it does serious damage to the whole highway program. That is the reason I say, while the conduct in itself was reprehensible, it is more so when you consider the adverse effect it is going to have on this program, which all of us on this committee want to see completed at the earliest time because of its vital necessity to the economy of the country.

End of Act I

The foregoing dismal dialogue took place in our nation's capital last year. It is taken verbatim from hearings on the "Relationship Between Contractors and State Personnel in Florida." The sections selected were fairly typical. Names were omitted not to be cautious—because this testimony is a matter of public record, available to anyone who requests it—but because similar disclosures were made in states other than Florida. The testimony is quoted not to point the finger at a particular state or group, but to offer a specific illustration of the practices that threaten the whole Interstate Highway System in the eyes of the public, which still must foot the bill.

This and similar testimony has been embraced by the nation's press and by several large circulation consumer magazines—notably Reader's Digest—to impugn our federal roadbuilding program as a billion dollar boondoggle crawling with graft. Roadbuilders have reacted with angry denials, claiming that everyone involved in the program shouldn't, in justice, be tarred with the brush of a few greedy or immoral characters.

Where does the truth lie? In an effort, at least, to put the question in perspective, I talked both with federal roadbuilding officials and with Walter May, chief counsel for the Blatnik committee.

May and his investigators first inquired into the defense aspects of the Interstate program early in 1960. There they turned up ridiculous snarls of governmental red tape in which necessary changes in the critical height of highway overpasses for defense needs were confused and delayed, thereby costing many millions of public dollars.

After hearings on the defense requirements of the program, May (a former FBI agent) channeled his investigations into the area of construction procedures and practices—first in Oklahoma, then in Florida. He has since sent his investigators into Massachusetts, and is now exploring hanky-panky in right-of-way acquisitions. Reviewing his investigations to date, May emphasized the following points when I interviewed him:

1. As a result of the facts brought to light in the Sub-committee investigations, the BPR has revised and improved its inspection procedures.

2. There is a much-too-general tendency to accept a certain amount of shady practice as a necessary part of any program so vast as the construction of the Interstate System. "People keep telling me," says May, "that there's bound to be a little graft. I find this statement irksome. Why does there have to be some corruption?"

3. Unethical practices probably extend much further than the cases already turned up by Committee investigators. "Oklahoma and Florida are not isolated cases," he says. "We're not interested in the fifth of whiskey or the ham at Christmas. The practice in many places has been to give state employees much more. But we haven't yet been able to prove that anybody got actual graft."

4. Investigators haven't even begun to lower the boom on route locations and rights-of-way, but they plan to. And they may likely turn up evidence even more sensational than that obtained in the construction investigations. Hearings will be coming up soon on this.

Says Walter May: "These investigations are neither easy nor cheap. One investigation is likely to take as long as seven months. But people can go along for years assuming things; we have the facilities and authority to get the facts. We haven't been formed to highlight the wrongdoing but, rather, to see that the highway program is properly administered and sufficient facts are available on which to base new legislation in this area.

"Neither our committee nor our investigators talk corruption. Other people do. We're in business to look into practices and procedures; we're not in business to expose corruption. The greatest friends of the highway program sit on the Blatnik Committee."

Highway officials generally would agree with May's summation. Their quarrel has been with the press, which has taken what they insist are isolated instances of poor ethics and blown these exposures into a condemnation of the entire program. They are particularly incensed with the Reader's Digest article, which reached a large consumer audience with a highly distorted picture—say highway officials—of the caliber of people involved in building the Interstate System.

When ROCK PRODUCTS questioned Rex Whitton, new head of the Bureau of Public Roads, on the highway scandals, he said:

"I think the irregularities have been overstated

in some segments of the press. There isn't a high percentage of stealing going on in the highway program and never has been. The irregularities that have been turned up have been magnified far beyond their part in the total picture. Yet, these disclosures have also performed a considerable service because they will certainly help us eliminate any dishonest practices that still exist.

"The Interstate program is large. It's difficult in a program of this size to avoid hiring a few people whose moral standards are considerably less than what we want. All we can do is set up checks that make it very difficult for them, and this we are doing. We've had such safeguards in Missouri for many years, and they work."

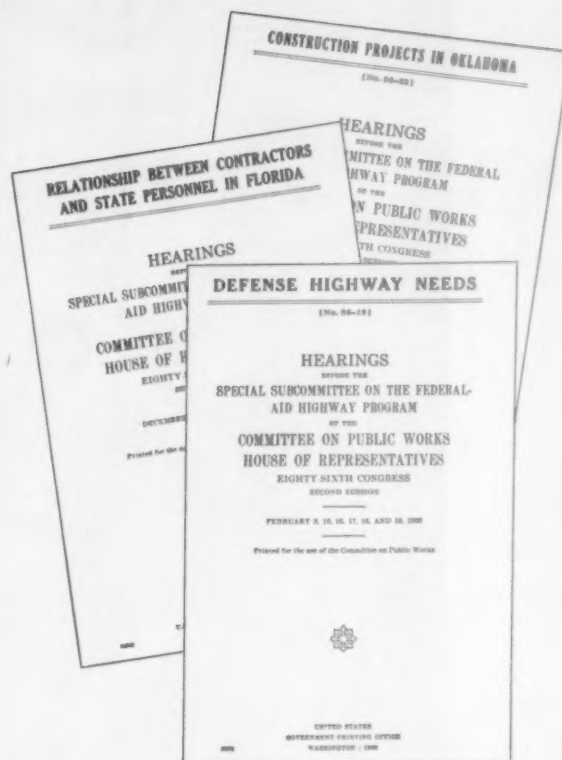
Thus, the major difference between highway officials and the House Committee investigating their activities appears to be one of degree. Although road officials would agree with most of May's comments in principle, they insist that the practices turned up—although highly reprehensible—are exceptional and involve questionable ethics more than outright felony.

In support of this, Glenn W. Holcomb, president of the American Society of Civil Engineers, pointed out recently: "I have been personally gratified to note that not a single employe of the Florida State Highway Department who has been named as the recipient of unauthorized payments from contractors is a member of the ASCE. I believe the record will show that few truly professional engineers in positions of significant responsibility have been derelict in their duty and in their fulfillment of the public trust.

"Our nation is engaged in the greatest construction project of all time. The civil engineer is the key to the successful completion of this tremendous program, and he will need the full confidence and best support of the public. We should not permit the unethical and otherwise questionable activities of a few individuals to impede the consummation of the Interstate highway plan, nor to becloud the importance of the achievement when it has been accomplished."

There will be more investigations, and there will be more sensational disclosures—particularly in the area of right-of-way acquisition. It will be important that the press and the public keep these disclosures in proper perspective. Bad ethics should be attacked wherever they are found—whether in business or in government. And without question, there have been some colossally bad ethics in the construction of our highways.

The fact that this isn't new doesn't make it any



the less reprehensible. But most of the disclosures turned up in the Florida investigation, for example, were of long-standing practices. This reporter has the uncomfortable feeling that many of the ethical improvements now taking place as a result of the investigations thus far—particularly among contractors—are due not to a new and enlightened look at some atrocious moral standards but, rather, out of fear of getting caught. True, it is better this way than not at all—but not much better. It is our feeling that the highway investigations have simply tapped a vein of public immorality that runs much deeper than just the highway program. Everything and anything that brings this sort of operation to light is for the good, but the danger is always present that the breast-beating following these disclosures will go to the other extremity and thereby water down considerably the moderate reforms necessary. Remember: Things are not as bad as they have been painted. And they will get better—in spite of more sensational disclosures that will inevitably be making headlines in the months ahead.

Editor's Note: The final installment in ROCK PRODUCTS four-part series on our current highway problems, "Where Does the Interstate System Stand Today?" will appear next month.



Muck zooms 70 ft. in the air when the shot is fired, expanding across a 225-ft. area. Rock Products readers are invited "behind the scenes" at this progressive operation to watch the complete foundations laid for blasting in step-by-step illustrations



Panoramic view of the Houdaille Construction Materials, Inc., Chimney Rock Quarry, which covers approximately 643 acres in the area of Bound Brook, New Jersey. Note accumulation of jetty stone in the right foreground

Case history of a blast

by Enid W. Stearn

Forty-thousand-ton shot is standard procedure at one New Jersey quarry



Above: Explosives charges are laid out behind each hole. Tape loop on shipping tube containers facilitates cartridge insertion, and end markings on each 50-lb. bundle permit easy identification. The American Cyanamid materials, which produced 4.39 tons of rock per lb. of explosive charge were: 1,750 lb. of 75-percent straight gel, 2,000 lb. of 60-percent standard gel and 3,500 lb. of 40-percent standard gel—packaged in 5 x 25-lb. containers; 2,000 lb. of Accomite blasting agent (nitro-carbo-nitrate), packaged in 50-lb. Multiwall bags

Above right: Hole depths are checked with tape, prior to loading primer charges. Depths range from 188 to 195 ft., with a 6.25-in. diam. Average spacing is 17 ft.; average burdens, 21.5 ft. Before the cartridge is lowered, via a plastic-reinforced Primacord, 250 lb. of 75-percent straight gel is loaded at the bottom of each hole

Right: Careful records are kept during each phase of loading, as charges vary within each of the six decks per hole. Seismographic recordings were made on each shot, and a complete report was furnished to the quarry engineers and New Jersey's Department of Labor & Industry. Personnel heading the operation were: P. Nepa, quarry foreman; A. M. Smith, quarry superintendent; F. A. Cecil, group superintendent for Houdaille rock operations, and M. Hankin, Jr., vice president of operations



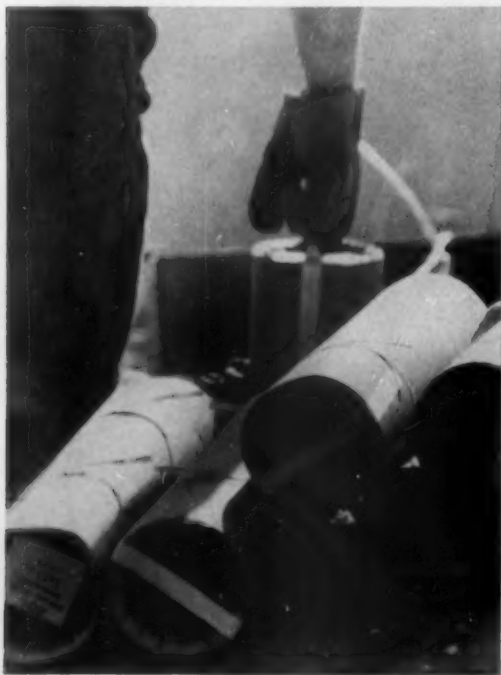
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Case history of a blast

continued from page 93



Above: Section being loaded is shown in this general view of the quarry face, here 182 to 190 ft. high. Note absence of toe and excellent face preparations. Raw material is Watchung Formation, diabase rock



Cartridges can be dropped if the hole is smooth and dry, as shown here. Otherwise, they must be rope-lowered by the tape loop of the shipping tube

Right: All electric blasting caps are rechecked with a galvanometer prior to final stemming

Below: Cap primers are lowered and taped to ensure proper depth. Two 25-millisecond delay caps are inserted in each primer stick, meaning that 6 caps are spaced in pairs at the top, middle and bottom of each hole. Quarry loading and decking time was kept to a minimum by assigning the crew to 1 hole per man





Crushed stone stemming averaging 19 ft. is used in the last stage of loading. Frequently encountered water conditions prohibit the use of stone dust



At 12:06 p.m., the shot is fired on signal

Below: "After" view shows uniformity of breakage and clean separation from the face. To get a better idea of the success of this shot, which yielded an estimated 40,662 tons of trap rock, compare this picture with that on the preceding page



*California producer's small
investment in jig
pays off in premium gravel*

Pennies save for

JIGS DATE BACK TO THE 15TH CENTURY—but it is only recently that aggregates producers have turned to this technique. Faced with dwindling high-grade reserves and ever-tighter specifications, many operators have been forced to give serious thought to the advantages of this way of beneficiating gravel.

S. H. "Ozzie" Osborne, superintendent of the Mission Rock Co., Santa Paula, Calif., is highly enthusiastic about his firm's efficient jig installation, "particularly when the initial investment barely runs to five figures, and the total operating costs can be held to 6¢ per ton."

Stringent California state specs are easily met since the jig was installed. None of the plant facilities had to be modified, and the entire initial investment was only 25 percent of the amount required to turn to heavy media separation.

The Santa Clara riverbed provides all plant feed for Mission Rock. This gravel contains about 22 percent deleterious material—mostly shale, lignite

Table 1—California shale specifications

<u>Percent Shale</u>	<u>Percent Sodium Sulphate Loss</u>
2	10
4	9
6	8
8	7
9	6

Left: A big rinsing screen gets the 1½ x ¾-in. gravel ready for the jig. Bins under the screen collect material that will bypass the jig

dollars

Mission Rock

by John H. Bergstrom

and sandstone. Fortunately, most of it is lighter than the acceptable gravel, especially the troublesome shale. California specifications relate allowable percentages of shale to sodium sulphate losses in the manner indicated in the table.

Gravity separation in the form of heavy media plants is in use in two other local operations, both of which also draw raw material from the Santa Clara River. (See *ROCK PRODUCTS*, February 1960, p. 98). But although Mission Rock realized a gravity process was essential to high-quality production, it hesitated to become involved with high initial investment and operating costs. Too, the presence of heavy sandstone created a problem; it is nearly as heavy as the acceptable gravel, so that the chosen method had to be doubly effective in removing the light material. Because of the sandstone, shale was held to a percentage of less than 2, providing the greatest latitude in the sodium sulphate loss.

The river acts as a classifier at this location. Mission Rock's deposit is in a bend of the river where the stream falls about 25 ft. in a short distance. The heavier and larger material tends to settle out, while more of the light material travels on downstream. Investigation of the pit run material showed that the No. 2 gravel ($1\frac{5}{8} \times 1\frac{1}{8}$ -in.) could meet state specs without beneficiation. Since there was no reason to upgrade the $\frac{3}{8} \times \frac{3}{16}$ -in. pea gravel, only the No. 3 gravel ($1\frac{1}{8} \times \frac{3}{8}$ -in.) re-

Please turn page

Right: This 5 x 7-ft. jig gives exceptional results on Santa Clara river gravel to remove deleterious shales from the 35-ton per hour feed



Pennies save dollars . . .

continued from page 97



High and low-level controls in the feed hopper automatically maintain the best flow of material to the jig



Three adjustable gates permit fine control of the depth of material on the jig

quired treatment. This meant that the total volume of material being beneficiated would not exceed 35 tph.

The fact that the beneficiating device would receive a sized feed, and the limited tonnages it would be required to handle, led Superintendent Osborne to investigate jigging as his simplest and most inexpensive solution. A sized feed is not essential to efficient jig operation, although it does simplify it somewhat. However, before making a final decision, extensive tests were run in an equipment manufacturer's laboratory. They revealed that a jig would easily produce specification material with little waste.

So the new system was installed and arranged so that the jig can be eliminated from the circuit. All material is then diverted into the former storage hopper for non-specification uses. A gate diverts the No. 3 rock to a 24-in. x 52-ft. belt conveyor which carries it directly to the jig feed hopper.

Hindered settling is the separation principle on which the jig works. Although a specific gravity process, it is definitely not a heavy media process. The only separating medium used in a jig is a rising column of water, which keeps the material on the jig bed in suspension as it moves from feed end to discharge end. The lighter particles, being more buoyant, form the top strata, while the heavier material works its way to the bottom.

To obtain a clean separation the jig must receive a steady feed, uniformly spread across the bed. The jig installed by Mission Rock had a 1-cu. yd. capacity feed bin with three adjustable gates to maintain a steady flow of material across the 5 x 7-ft. bed. "Ozzie" Osborne developed some modifications to this feed system that have proved so satisfactory that the manufacturer is considering offering them as optional equipment on future installations.

The first modification was to increase the feed hopper to 1½ cu. yd. capacity. Next, three level indicators were installed in the hopper, one near the top, one two-thirds of the way down, and the last near the bottom. When the bin fills to the level of the top indicator, it automatically turns off the feed conveyor. The conveyor starts again when the material drops to the level of the second indicator. If for some reason the flow of material is not resumed before the bin level drops to the position on the third, the jig is automatically turned off.

Water is supplied through a 6-in. line at a rate

between 300 and 400 gpm. at a pressure of 25 psi. A pressure gauge installed in the line gives the operator complete control. A rubber diaphragm beneath the water inlets, which is accentuated by an eccentric shaft, pulsates the water upward through the jig bed at about 160 pulsations per minute.

The jig bed itself is a punched steel plate, with channel troughs placed at right angles to the material flow, and filled with $\frac{1}{16}$ -in. diam. steel balls. The water is forced between these steel balls, producing the uniformly rising current necessary to obtain proper stratification.

Both the heavy sound gravel and the lightweight deleterious material discharge from the end of the jig bed directly into a two-compartment steel bunker. At the jig discharge lip a special skimmer removes the light fraction, which is rejected to either side of the jig while the sound portion continues into the bunker. Excess water and the heavier fines are carried by a 10-in. line to the plant's sand classifier. Although a certain amount of sound rock is carried off with the lightweight deleterious, this is not a serious problem. Reject runs about 23 percent of total feed. Of the reject, only about 20 percent or less than 4 percent of the total, is acceptable material. But the reject is not wasted. There is a steady demand at a reduced price for this material as fill and for other non-specification uses.

The heavy material has been able to easily meet state specs. Although some of the feed contains as much as 10 percent shale, all the processed material contains less than 2 percent when it is regularly checked.

Current production is about 35 tph. of $1\frac{1}{8}$ x $\frac{3}{8}$ -in. gravel. The jig could probably handle a larger capacity, if needed. Its present efficiency was reached after almost four weeks of careful experimental adjusting, but once adjusted, these setups do not require an operator, since it is seldom necessary to alter the basic settings.

At this time, over 40 plants in the United States are using jigs to beneficiate either sand or gravel. All in all, it is easy to see why Superintendent Osborne says, "We are well satisfied with the way the jig has worked out."

END

MAJOR EQUIPMENT REFERENCE

Belt conveyor, 24-in. x 52-ft.	Chain Belt Co.
Jig, 5 x 7-ft.	Meckum Engr., Inc.
Bin level indicators, (3)	Bin-Dicator Co.



Levers above the discharge end of the jig control the "slice" between acceptable material and rejects



Accepted gravel slides over a dewatering plate into a bin. Rejects average about 23 percent of total feed



Here's typical fast Michigan Model 275A loading: two passes of $4\frac{1}{2}$ yd bucket, 40 seconds heap 10 ton truck.



Model 275A bucket-loads average 4.50 yards, 5.85 tons each, per scale-measurement.



Frequent Michigan odd-job: cleanup after blasting. Unit works much faster than crawler-dozers, has added advantage of being able to bucket-lift rock higher than can blade.



Michigans move fast around the quarry, average 18 mph, often hit top of 28 mph.



Here's an unusual but profitable market for LaGace: $\frac{1}{4}$ " stone for ice control. Last year, the company sold over 25,000 tons to airports and highway commissions. Like most limestones, this material contains small percentage of salt. Thus it has advantage of sticking to ice and not rolling off like sand. The result: better traction for airplanes and cars. Some of the material is stored under cover and sold dry; other customers prefer to buy from this open stockpile. The LaGace firm also makes substantial sales to the concrete industry (mostly $\frac{3}{4}$ " to $1\frac{1}{2}$ " unwashed stone) . . . asphalt producers (200 mesh) . . . roofers ($\frac{1}{8}$ " . . . paving contractors ($\frac{1}{2}$ " to 4") . . . and fertilizer plants (5 mesh).



There are, in Quebec, 27 major stone quarries. Almost all of them, 25 to be exact, do their stockpile loading with Michigan Tractor Shovels

The amazing record of one machine at one pit:

416 TRUCKS LOADED IN 8 HOURS !

Production like this certainly *helps* explain the popularity of Michigan Tractor Shovels.

But there are other reasons for this popularity—reasons which *might be of great importance in YOUR profit picture*. As a case in point, let's take ownership in Quebec, Canada.

In Quebec, over 90% of all the major rock quarries use Michigan Tractor Shovels for stockpile loading! This overwhelming preference, this record of buying and rebuying at this location, we feel, is particularly significant. For in Quebec, machines are tested by terrific extremes of *working temperatures—40° below to 110° above*. Tonnage demands are increasing rapidly. Distances are great and job sites are often hundreds of miles from repair and maintenance facilities.

Repeat buyer likes Michigan dependability, dealer service

One typical Quebec owner—LaGace Quarries Ltd, Montreal—exemplifies the reasons for Michigan popularity under these conditions. "Michigans usually load faster than other Tractor Shovels," says Paul LaGace. "Hence they produce more. Michigans cause less trouble, me-

chanically speaking. And when something does go wrong, we get excellent service from our Michigan Distributor (Blackwood-Hodge Ltd) and from Clark Equipment Company."

The LaGace firm reports from long experience. They bought one of the first Michigan Tractor Shovels sold in Canada—a 1½ yd Model 75A—in 1954. Today, they own six Michigans: the original Model 75A, two Model 175A's equipped with 2¾ yd buckets, and three Model 275A's with 4½ yd buckets.

20 seconds per bucket load

Loading with *any* of these units from *any* of 22 crushed stone stockpiles—4" and run of crusher to lime dust—takes an average of only 20 to 25 seconds per pass, according to company time-study averages. Thus, a skilled operator and a 4½ yd Model 275A regularly heap a 25 ton hauler in five passes, under 2 minutes. A 12 ton tandem-axle truck takes a 275A two passes, 40 to 50 seconds. Top daily load count, so far, for a Model 275A has been an amazing 416 trucks, 10 to 15 tons each, in 8 hours! Production, overall, with the six Michigans loading at LaGace's two pits, has averaged 1,000 to 2,000 tons

hourly—over three times as much as before Michigans.

Other jobs: loading shot rock, cleanup after blasting, etc.

The Michigans do a lot of odd jobs too. In emergencies, they have loaded quarry rock. Several of the units often handle cleanup after blasting, dozing and lifting material into high, centrally-located shovel-efficient piles. At times, they clean spillage from haul roads and crusher sites. They tow stalled vehicles. In winter, they plow snow. As Raoul Savage, quarry supt, puts it, "*Whenever we want to lift or haul anything, we just call for one of the Michigans.*"

Good advice! If you *don't have* a Michigan—or if you'd like to see the performance advantages of our *latest models*—call your Michigan Distributor for a demonstration. Pick the size you want to see—nine models, with buckets from 16 cu ft to 10 cu yds, 3,000 to 30,000 lb lift capacities.

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Left: Chemists at work. Chief Chemist Mel Sutton watches as Frank Parker and John Pennell, research chemists, run an experimental batch of concrete. Interior view of lab shows how some of the basic equipment is organized

Below: Modern exterior of lab exemplifies attractive qualities of concrete products



New research lab probes concrete products

by Ralph S. Torgerson

IF EVER A COMPANY capitalized on research, that company is Calaveras Cement Co., now a division of The Flintkote Co. Innovations that are traceable to its laboratory quickly find their way into the company's San Andreas, Calif., plant. Now, Calaveras again demonstrates its faith in research by establishing a cement and concrete research laboratory.

Both process and product research will be conducted in the new laboratory under the direction of M. C. Sutton, chief chemist. According to William Wallace Mein, Jr., president, the laboratory will study ways to advance the use of cement in all phases of the construction industry.

One of the lab's first assignments will be analysis of special cement requirements for prestressed, tilt-up, and lift-slab concrete units. Early attention also will be given to the special requirements of steam-cured concrete, and to the uses of admixtures and additives in cement and concrete.

The 1,800-sq. ft. research laboratory is completely separated physically from the company's main laboratory which supervises day-to-day production control. Its special features include isolated rooms for arc clinkering and the mixing of alcohol-glycerol solutions, and a large fog room for concrete specimens undergoing tests in which both temperature and humidity are automatically controlled.

The structure itself demonstrates the attractive and utilitarian qualities of concrete products. Walls are of concrete block on three sides and poured concrete on the fourth. The roof consists of prestressed double-T sections and the floor is a concrete slab.

Many of the manufacturing innovations already introduced at the San Andreas plant resulted directly from laboratory observation and experimentation. The company generally is recognized as one of the pacesetters in the development of new technology for cement production. It pioneered in the use of kiln temperature controls, and was probably the first to install an automatically operated kiln.

Right now Calaveras is experimenting with gamma ray detectors for control of solids in feed to the kilns, as well as with flow meters to control the feed. The company also is experimenting with bed-depth controllers on the kiln coolers in an attempt to achieve uniform heat recovery.

Lower production costs and product uniformity have been the main objectives of the company's pioneering efforts in recent years. In the quarry, for example, Calaveras cut drilling costs by introducing the first giant rotary drill of its kind to the western half of the United States. As a result of its early experimentation with ammonium nitrate, it cut costs of explosives by 75 percent.

Please turn to page 104



U.S. Gypsum installs 24 Sweco separators in 16 plants

United States Gypsum Company's experience with SWECO Vibro-Energy* Separator performance ranges over 10 years and a variety of demanding applications. As a result of proved efficiency, economy and versatility, another SWECO unit was selected for installation at its recently completed, modern New Orleans quicklime facility. Also, the "turnkey" contract for design, engineering and construction was awarded to Southwestern Engineering Company.

This single-deck, 48" diameter SWECO unit is equipped with a $\frac{3}{8}$ " clear-opening screen cloth for processing cal-

cined clam shells. Material runs from fines to 2" pieces, at 100-150°F and 58-60 lbs. per cu. ft. High capacity throughput with no screen blinding yields low operating and maintenance costs. Simplicity of design and lack of transmitted vibration required minimum space and structural support. For full details, application data, or free screening demonstration in *your* plant with *your* materials, write SOUTHWESTERN ENGINEERING CO., 4800 Santa Fe Avenue, Los Angeles 58, Calif. Department 5214.

✦ Vibro-Energy separators, grinding mills, finishing mills ✦



Enter 1215 on Reader Card

New research lab . . .

continued from page 102

Addition of a tertiary stage to the crushing of raw feed resulted in an increase in over-all plant capacity. The substitution of cyclone separation for bowl classifiers improved the efficiency of the mill circuit by eliminating tramp oversize, and more than doubled the percentage of slurry solids flowing to the thickeners. Results of this change-over were a greater uniformity of feed and increased fuel efficiency.

In its plant maintenance operations, the company also has improved techniques as a result of careful investigation. Pinion and trunnion lubrication is automatic on all mills and kilns, providing better lubrication with less grease and oil.

Manufacturing innovations based on Calaveras research findings will be incorporated in plans for an ultramodern new cement plant which the company will build near Redding, Calif., this year.

MAJOR EQUIPMENT USED IN THE CONCRETE LAB

Curing facilities: Fog room, constant temperature, 100 percent relative humidity, for storage of concrete test specimens. Equipped with Foxboro Model 40 stabilog temperature and dew-point recorder and temperature controller.

Steam cabinet, two-compartment, for atmospheric steam curing of concrete at temperatures

of 80 to 190 deg. F. Constructed of lightweight Crystalite block (Galt, Calif.), with individual thermocouples for each compartment controlling solenoid valves to maintain constant elevated temperatures. Steam for the unit is supplied by a Malsbary Model 19A steam generator.

Autoclave, for high-pressure steam curing of concrete. Gauge pressures to 350 psi.

Compression test machines: Tinius-Olson 300,000 lb., with adapters for testing 8 x 8 x 16-in. masonry block in compression and 6 x 6 x 48-in. beams in flexure.

Southwark-Emery 75,000 lb. for testing 3 x 6-in. concrete cylinders and 2-in. mortar cubes.

Two E. O. Schmidt rebound concrete test hammers for non-destructive testing of concrete in place.

Mixers: Concrete and utility mixer, 2.5 cu. ft. capacity, Sears Roebuck & Co., Homart Model 9536.

Counter-current, rapid batch mixer, Lancaster with 17-in. diam. x 8-in. high bowl.

Laboratory mixer, Hobart Model N-50, planetary mixing action, 5-qt. capacity.

Paddle mixer, scale down model of a two-sack mixer used by plastering trade.

Sieve apparatus: Gilson testing screen equipped with full set of screen trays.

Rotap sieve shaker for 8-in. diam. Tyler standard screens.

Cenco-Meiner sieve shaker for 8-in. diam. Tyler standard screens.

Crushing & pulverizing equipment:

Bico-Braum chipmunk crusher, Type WD.

Bico-Braum direct driven pulverizer, Type UD.

Paul O. Abbe ball mill, No. 1, double jar.

Paul O. Abbe ball mill, assay, double jar.

Muffles & drying ovens: Soiltest oven, Model L-90, gas fired, floor model.

Denver equipment drying oven, Model MT, equipped with exhaust fan.

Soiltest drying oven, Model L-5, Blue M, electric, 40-200 deg. C.

Temco furnace, Model 1730, operating range 100-2,000 deg. F.

Miscellaneous equipment: Drill press, floor model, Sears Roebuck & Co., Craftsman Model 150.

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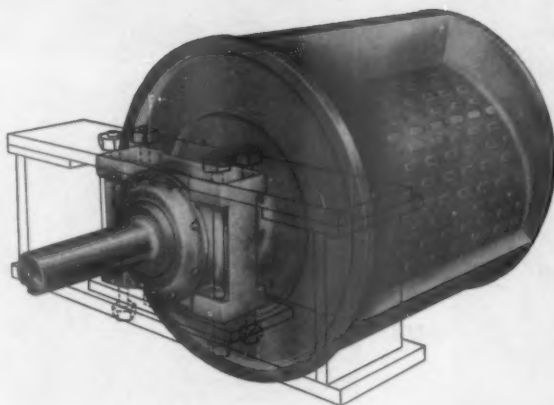


Mel Sutton, left, checks a reading in the Calaveras research laboratory with John Pennell

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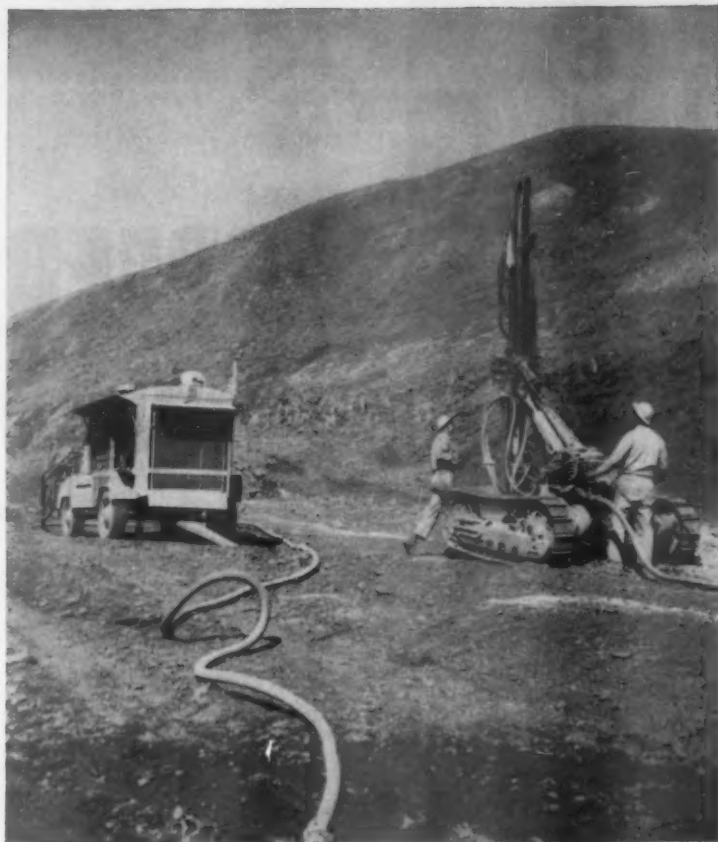
Ray-Man belts on other machines of this type have hauled over 12,000,000 tons—outperforming all competitive belts. Splices last twice as long because double ply compensation relieves outer ply stress at bends. Ray-Man trains naturally, resists impact and ripping, requires no breaker ply. Exclusive XDC cover prolongs belt life. Let an R/M distributor show you how an R/M Conveyor Belt can outperform other belts on your conveyors. Write for Bulletin M302 and Catalog 25CB.



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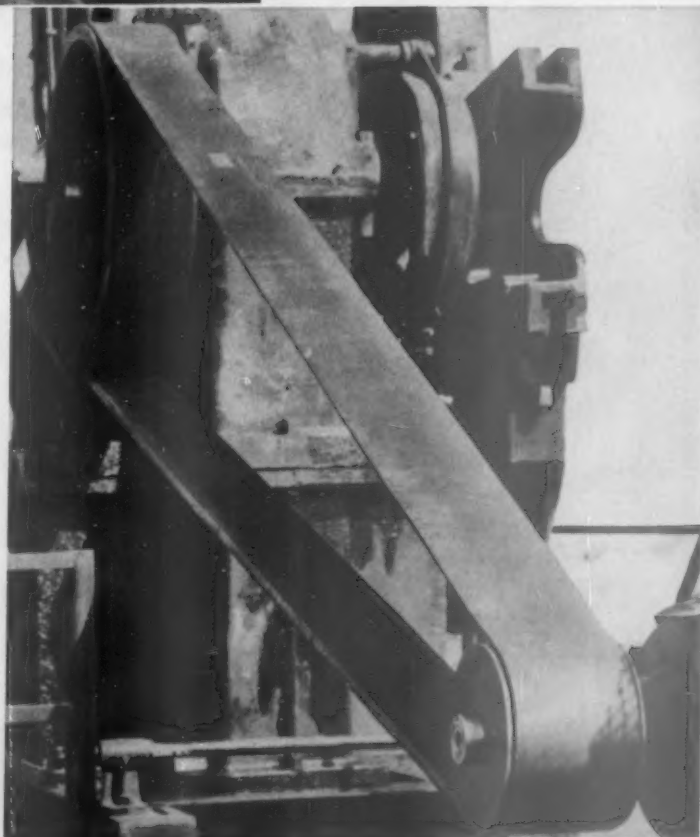
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Here's a roundup of the automatic samplers now available to rock products producers

Automation spurs sampler design

by John A. Mitchell*

IN ITS PROGRESS TOWARD AUTOMATION, the cement industry is working on a number of processes to bring the goal nearer. Sampling is one of these vital areas. Much good work has been done in automatic sampling, but more needs to be done because truly representative samples are required for complete automation. I have prepared this round-up of sampling methods now in operation to point out the advances that have been made.

The automatic sampler most prevalent in the industry is the screw-type sampler. Some of the others are the cutter type, the rotating scoop and the Vezin sampler, to mention a few. And many of the plants are designing their own samplers, to speed the day when a completely satisfactory technique has been obtained.

The ideal automatic sampler must possess these features:

- (1) It must take the whole stream (wet or dry) part of the time and not part of the stream some or all of the time, because the components are seldom evenly distributed across the stream.
- (2) The mechanism that takes the sample must move completely across the stream. If it enters from one side and is withdrawn on the same side without having completely crossed the stream, a truly representative sample will not be obtained.
- (3) In order to take equal proportions from all parts of the stream, the sampler must move at a

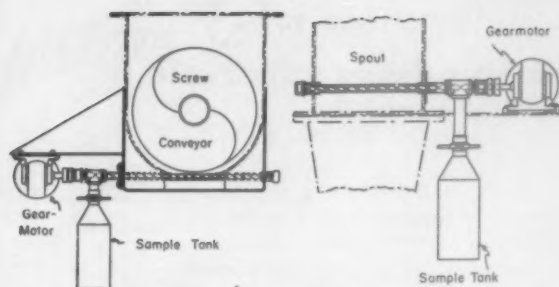


Fig. 1—Fuller-Anderson sampler

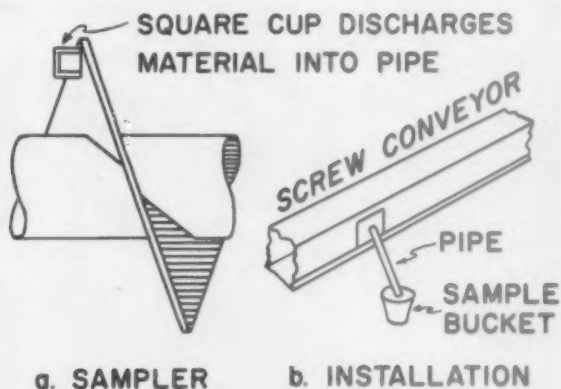


Fig. 2—Cup-type sampler



Fig. 3—Helical tube-type sampler; (A) end, (B) side

uniform rate. The top of the sampler opening must be at right angles to the direction of the stream in all positions. The last condition, in the case of a revolving sampler, is well obtained from a vertical stream and a horizontal sampler scoop.

(4) If the sampler revolves about an axis, two sides of the sampler opening should converge toward the axis in order to take equal proportions from all parts of the stream.

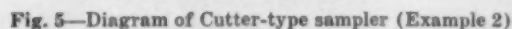
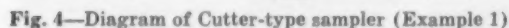
(5) The ratio of the weight of sample to the material flow should be constant.

(6) The sampler scoops must be deep and broad enough so that the material which has once entered will not bound out again, and if the sampler scoops have closed bottoms, they must not be allowed to fill up so that the material runs over.

Please turn page

*Manufacturing Process Engineer, Portland Cement Association, Research & Development Laboratories, Skokie, Ill.

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At one cement plant, a wood drill bit was substituted for the original twisted flat steel bit. The modification was made because the sampler would occasionally plug due to the screw not being able to move the packed material within the screw housing. The modified sampler, however, would flush at times due to excessive wear of the screw

Please turn to page 112

TELSMITH

designed for extreme flexibility with a wide variety of products

TELSMITH EQUIPMENT

in this plant has two circuits: one with 24" x 5' Plate Feeder, 4' x 10' 2-deck Scalper, 4' x 12' 3-deck Vibro-King wet screen, 20" x 15' Twin Screw Classifier for concrete sand, 48" x 30' Sand Drag for mason sand. Gravel circuit has 10" x 30" Jaw Primary Crusher, 4' x 10' 1-deck Vibro-King dry sizing screen, 36-FC Gyrasphere Secondary Crusher, and a second 4' x 12' 3-deck Vibro-King wet screen.

This plant was tailor-made by Telsmith to produce aggregates for its owner's bituminous concrete plant, and for commercial use in the area. Products are Pennsylvania Highway Dept. specs Nos. 3A, 2A, 2B, 1B, Class A concrete sand, mason sand, and asphalt sand. In addition, minus 1" and minus 1/2" round

gravel may be extracted and blended into final product either crushed or uncrushed when making crushed concrete specs. Plant capacity is 100-125 tph. Plant was designed and its Telsmith equipment supplied by A. R. Amos Co., Telsmith distributor, Philadelphia, Pa. Send for Bulletin 266.

G-33-960



▲ Keystone Pavement & Construction Co. Lake Ariel, Pa. plant (general view).

◀ 24" x 5' Plate Feeder, 4' x 10' 2-deck dry Scalper, 10" x 30" Jaw Primary Crusher.

◀ 4' x 10' 1-deck Vibro-King sizer screen and 36-FC Gyrasphere Secondary Crusher.

Two 4' x 12' 3-deck Vibro-King wet screens, 20" x 15' Twin Screw Classifier, 48" x 30' Sand Drag.



SMITH ENGINEERING WORKS
508 E. CAPITOL DRIVE, MILWAUKEE 1, WISCONSIN

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Sampler design . . .

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flights which allowed the material to flow through the sampler without being thoroughly mixed.

This flushing action was detrimental in producing a good sample. To overcome this, a new pipe to hold the sample screw was installed; instead of using a long narrow slot which at times would plug up, the top half of the pipe was cut away for a distance of 5 in. in the center of the pipe. After these changes were made, the sampler obtained samples at a uniform rate.

Another plant modified the commercial sampler by installing a larger-diameter screw assembly in order to obtain satisfactory results by increasing the sample size. Contrary to this modification, a group of plants fabricated a miniature screw and installed it in the sampler; they too, obtained satisfactory results.

Plant-fabricated screw-type samplers are similar in construction to the commercial sampler. They are essentially small screws enclosed in a pipe or housing with a slot or series of holes in the top of the housing. The sample enters the opening and is carried out by the screw to a suitable container. Speed of rotation is determined by the sample size desired for a given time period. The screw can range from a single wood auger bit to a highly machined screw. Over-all dimensions of the sampler are determined by the material flow rate, the desired sample size, and the width of chute. The over-all diameter of the screw can vary from $\frac{3}{4}$ to 3 in. and the speed from 1 to 108 revolutions per minute.

Comments from personnel at several plants as to the performance of screw-type samplers ranged from "fair" to "very satisfactory." Periodic grab sampling is normally used to check the performance. The personnel at Plant A reported the follow-

ing results as to the comparison of data from the commercial sampler versus grab sampling after a lengthy series of tests:

Sampler	Percent carbonate
Commercial screw-type sampler	77.6
Grab sampling	77.7

By comparing these results, they feel the commercial screw-type sampler is doing a good job.

Difficulties that arise when using the screw-type sampler can be summarized as follows:

(1) The intake slot has a tendency to plug up.
(2) The sampler has a tendency to flush when the screw flights are worn.

(3) A truly representative sample is not obtained when the sampler cuts only part of the stream.

(4) If located within a pneumatic pump hopper, the obtained sample may not correspond closely to the material stream composition, presumably due to air currents in the hopper which tend to give an erroneous sample.

(5) Some screw-type samplers have a tendency to fill up and choke if not properly sized.

To improve the performance of screw-type samplers located in screw conveyors, mixing vanes should be installed just ahead of the sampling point so that a more homogeneous sample can be obtained.

Plant B has a cup-type sampler (Fig. 2) located in the collector screw which delivers the discharge from the screen-clad screw portion of another collector screw to a pair of pneumatic pumps. The feed handled by these two screws is the discharge from the Raw Department tube mills and the stream from the return-dust addition spout. The sampler was designed and fabricated at the plant.

A 2-in. square cup is welded onto the back side

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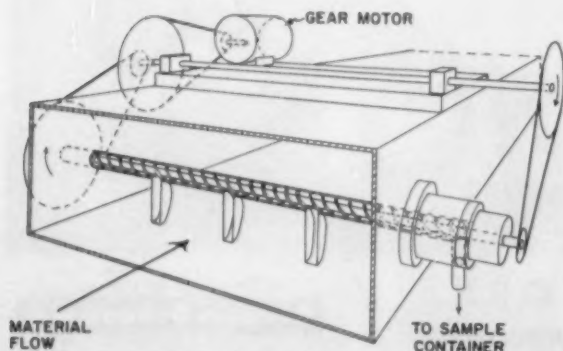


Fig. 6—Sketch of airslide sampler

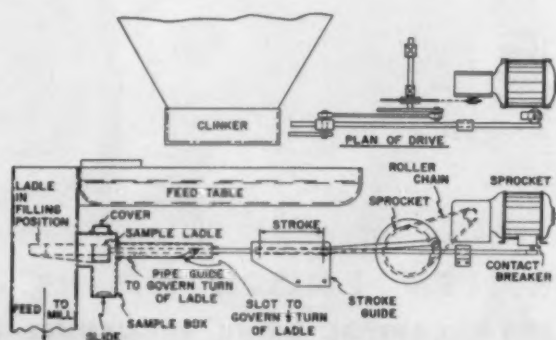
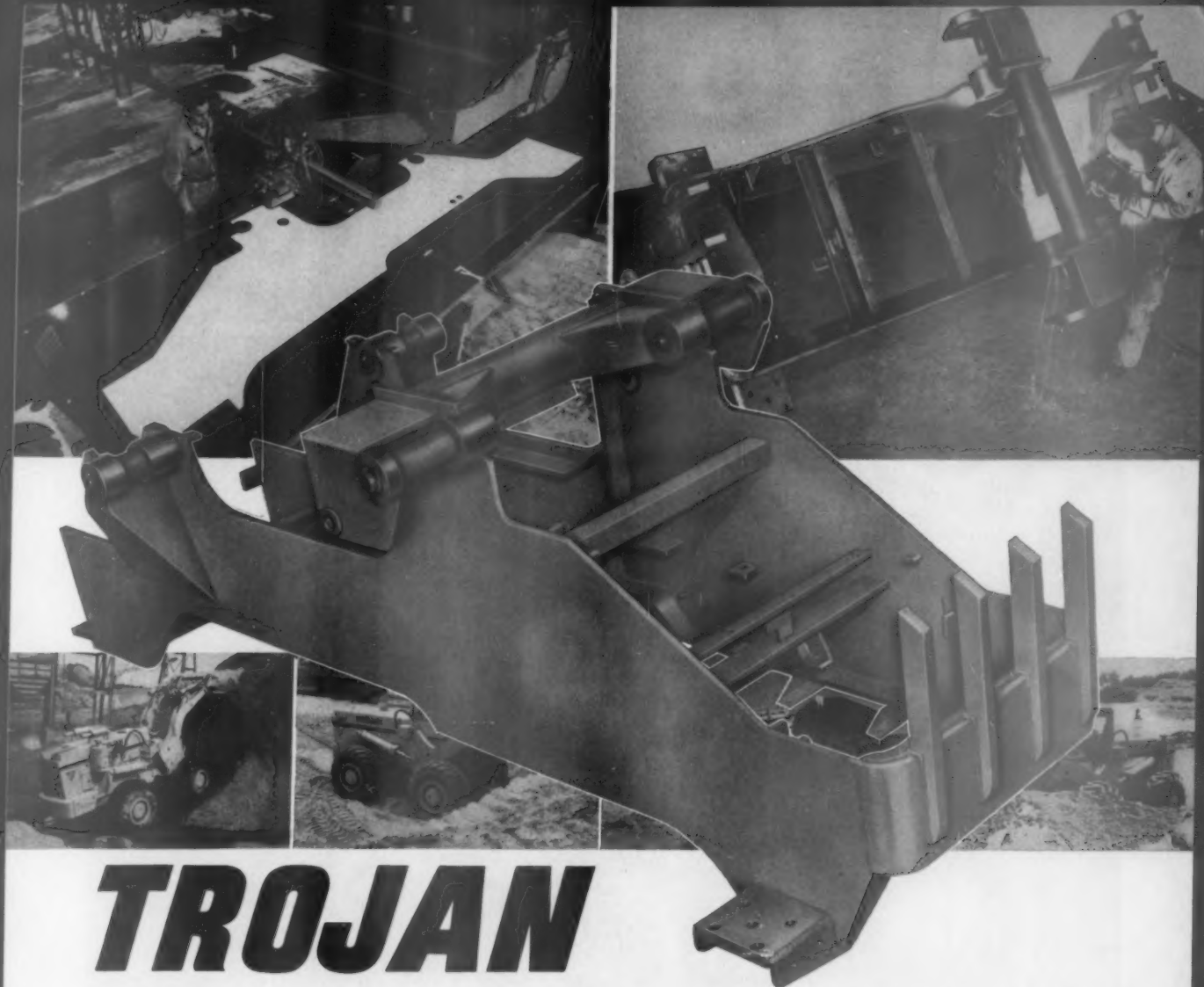


Fig. 7—Scoop-type sampler for clinker



TROJAN

Buils in "Extra" Strength with one-piece side frame construction

Trojan cuts the entire side frame from extra-heavy steel for maximum strength, durability, and operational simplicity . . . Obviously, this is a more costly operation; but the results are worth it! . . . The smooth, continuous contour completely eliminates the undercuts for bracket attachments necessary in ordinary built-up frame sections — therefore, eliminates the possible stress concentrations that lead to frame failure . . . This also allows complete protection *inside the frame* for fuel lines, wiring and hydraulic lines — shielded by a solid wall of steel from possible damage during rough work. This advanced Trojan technique means fewer

parts and closer dimensional control — plus the elimination of potential trouble spots due to joining members that may not be of uniform strength . . . In addition, Trojan's unique "wide foot" design of frame connection adds rugged strength to the rear cradle supports. The frame is just another example of the extra care that goes into the construction of every Trojan — extra care that results in complete dependability on the job . . . Ask your Trojan distributor for a point-by-point inspection or an on the job demonstration of Trojan's seven-model line with lift capacities from 7,000 to 24,000 lbs.

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TROJAN DIVISION • BATAVIA, NEW YORK

Sampler design . . .

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and near the outer periphery of a flight of the collector screw at a point as close to the pneumatic pump hopper as possible. Welded to the side of this screw box is a $\frac{1}{2}$ -in. diam. pipe which extends through the conveyor box sides. It is in direct line with the position of the cup so that centrifugal force will throw the sample into the open pipe. The pipe is set at an angle so that the sample will flow by gravity into the container. A deflector plate is located over the $\frac{1}{2}$ -in. pipe inside the screw box, so that the opening size in the pipe can be adjusted and the amount of sample is controlled.

This sampler requires minimum supervision and maintenance. The fluctuations in the clinker lime content are predicted by the fluctuations in the lime content of the samples of kiln feed obtained from the sampler; and, therefore, according to the plant personnel the samples are representative.

Plant C has a helical tube-type sampler (Fig. 3) for sampling the clinker stream going to storage as well as the clinker stream going to the finish mills. It is a motor-driven plant-made sampler.

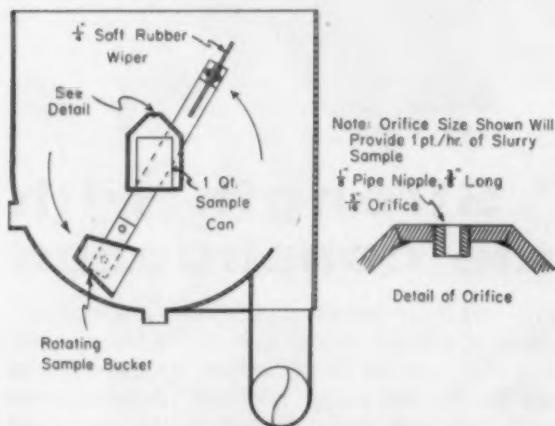


Fig. 8—Continuous scoop-type slurry sampler

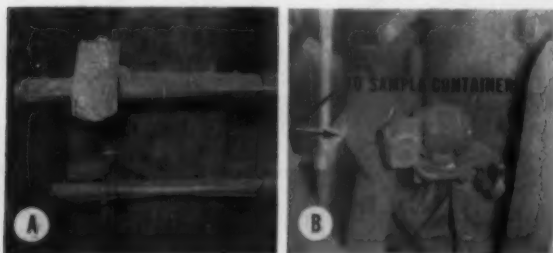


Fig. 9—Crushed stone sampler; (A) sampler scoop, (B) sample splitter

There is a 3 x 3-in. opening in the end of the helix, and the speed of rotation is 3 rpm. The sampler is mounted across the clinker conveyor; and as the sampler rotates, the opening picks up the clinker from the stream dropping from the end of the shaker conveyor. The sampler is a closed helix screw wrapped around a rotating shaft. The effect of the helix screw is to transport the clinker from the pick-up point horizontally to the conduit and the sample storage. According to the plant personnel this sampler does a satisfactory job in both applications.

Cutter-type samplers are used at Plants D and E. The former is a double, cutter-type, automatic sampler for raw mix. A diagrammatic sketch is shown in Fig. 4.

A chain-drive sampler with a cutter is set to take a cut once each minute of the flow of product from roll mills. Output of the mills is approximately 180 tph. This product is all minus-4 mesh, and the size of sample is 1,000 lb. per hour.

This sample is then fed through a roll-type crusher so that all of the material will pass through a minus-10 mesh screen. The crusher was built by the plant shop.

The material then flows to a plant-fabricated secondary sampler equipped with a continuous, oscillating, straight-line cutter driven by a $\frac{1}{4}$ -hp. variable-speed drive. This produces a 25-lb. sample each hour. The remainder of the stream is combined with the output stream from the roll mills. The sample is riffled twice. The first riffling produces a 2 to 3-lb. sample and the second riffling produces a $\frac{1}{4}$ -lb. sample.

The efficiency of this sampling system in producing a representative sample has been checked only to the extent of comparing the chemical analyses of the raw mix with the chemical analyses of the clinker produced in the kilns. While this may show a difference between the two, it is always in the same direction and of the same magnitude. The raw-mix sample is checked hourly for total carbonate and magnesium carbonates using acid-alkali titration. Total time from obtaining riffled sample to end of titration is approximately 15 min. If material correction is required, it is made on the feed to the roll mills.

Plant E has a cutter-type sampler to sample material going to the rock-storage blending piles. Fig. 5 shows a diagrammatic sketch of the sampling system.

A chain-drive cutter sampler takes cuts of ham-

Please turn to page 116



We've put a bulletproof vest on our bullet

(It ends lead build-up in our kiln gun)

This bulletproof vest is made of cardboard. It's a wax-impregnated wrap that we placed around the lead slug of Western's Industrial Ammunition to keep the slug from coming in contact with the kiln gun barrel and muffler. Because of it, lead build-up is no longer a possible troublemaker. And along with Western's cup-wad seal, the bulletproof vest contributes to the virtual elimination of blow-by. (But it's added nothing to the price.)

One Ramset Ringblaster kiln gun in use at one of the world's largest cement plants has so far fired over 250,000

rounds of Western Industrial Ammunition without any trace of lead build-up. Or any *other* maintenance problems for that matter.

Together, the Ramset Ringblaster and Western shells comprise a system for keeping kilns clear of obstructions. A fast, economic, efficient system. And now they've been engineered to keep themselves clear of obstructions.

For more information on the Ringblaster kiln gun and the line of Western Industrial shells, write to Ramset.

Ramset

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ROCK PRODUCTS, June, 1961

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Sampler design . . .

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mermill product (minus- $\frac{3}{8}$ -in. rock) going to the blending piles. This cutter makes a pass every 90 sec. across the 300-tph. stream. The sample then passes through a roller mill fed by a rotary feeder, reducing the rock size to minus-50 mesh.

The material, after passing through the mill, goes to a cyclone from which it flows by gravity to a second chain-drive sampler which takes a cut of the stream every 20 sec. The remaining portion of the original sample is returned to the rock belt going to the blending piles. After the second cutter has obtained a sample, the sample is blended in a V-type blender for a period of 5 min. A $\frac{1}{2}$ -pt. sample is obtained from the blended material and sent to the lab for analysis via a pneumatic tube.

An X-ray analysis unit will be used to analyze the sample for the same elements as done by the standard wet-analysis method. When in full operation, they expect to sample and analyze every 2 to 4 hr. From the time the sample is received, prepared, and recorded on tape, a complete analysis can be made in 20 min.

At the present time and until the system is operating properly, samples obtained from a cross-screw sampler located in the product stream from the raw blending silos are used to check the main sampler. According to the plant personnel, this cutter-type sampler is doing a satisfactory job.

Scoop-type samplers are used in four ways to sample (1) raw mix from a pneumatic gravity conveyor, (2) clinker from mill feed, (3) slurry from a raw mill and (4) crushed stone from a belt. These are at the following plants:

Personnel at Plant F have designed an automatic sampler to sample the raw-mix pneumatic gravity conveyors, and they have reported satisfactory results from its operation. It is essentially a horizontal hollow tube with several scoops attached at right angles to the tube (Fig. 6). As the tube and scoops rotate, the sample is picked up. A choke screw which rotates inside the hollow tube carries the sample to a container. The hollow tube and the choke screw are driven by a sprocket drive from a single motor. The proper speed of rotation of the scoops must be determined for the material being sampled.

Plant G has a mechanical scoop arrangement (Fig. 7) that periodically withdraws a scoop of clinker from a falling stream feeding the finish mills. After withdrawal, the scoop is rotated and sample dumped into a container at regular intervals by a timing arrangement. Entire sampler is

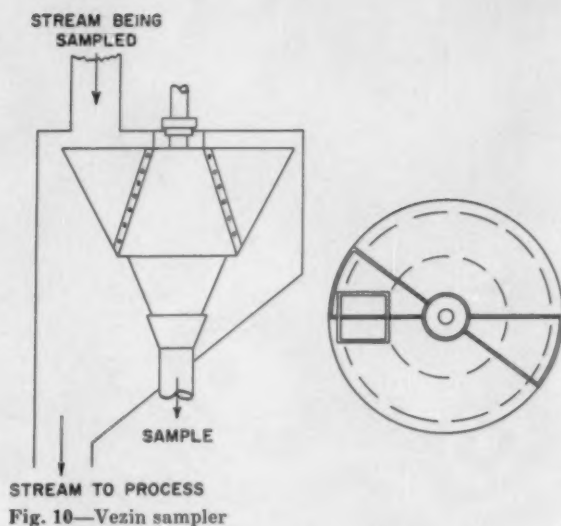


Fig. 10—Vezin sampler

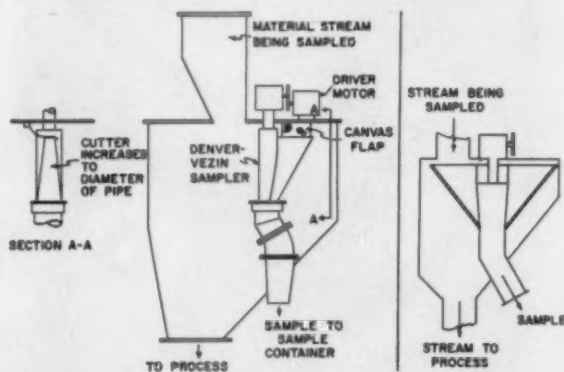


Fig. 11 (left)—Denver-Vezin sampler (Example 1)

Fig. 12 (right)—Denver-Vezin sampler (Example 2)

plant designed and fabricated. According to the plant personnel the sampler is doing a good job.

Plant H has a rotating scoop sampler (Fig. 8) which samples slurry from the raw mill. The sampler rotates for 15 sec. out of every 2 min., discharging to a container, and the collected sample is picked up hourly by a sample man. Sample is checked for moisture, CaO, and fineness.

Plant I has an automatic stone crusher and sampler (Fig. 9). The stone traveling on the crusher-house conveyor belt falls into a chute which leads to the storage conveyor belt. A company-designed scoop (Fig. 9a) driven by the crusher-house belt samples the stone falling in the chute and feeds this sample into the crusher hopper. In

Please turn to page 118

CORHART "BALANCE" PAYS OFF.....**HERE!**

398 days between hot zone repairs

HOT zone refractories in this cement kiln "held the line" for 398 days between repairs . . . *substantially more than two times longer than usual!* A good portion of the credit for this outstanding run can be traced to a 15-foot panel of fusion-cast Corhart 104 refractory, located strategically at the heart of the hot zone.

The Corhart panel was installed in the kiln's most severe wear area to balance refractory life *throughout* the hot zone. Corhart 104 can do this because it is *not* a conventional refractory . . . it is a patented product made by Corhart's electric melting process. As a result, 104 resists spalling and chemical attack up to two or three times longer than conventional linings.

Corhart balance adds-up to longer continuous production runs, lower repair costs, and much lower refractory-cost-per-ton-of-clinker. Investigate the benefits of Corhart 104 before your next repair. Write: Corhart Refractories Company, Incorporated, 944 Commonwealth Building, Louisville 2, Kentucky.



Closeup shows thickness and coating of Corhart 104 section after 398 days in operation. This is a high-capacity rotary kiln with a Lepol pre-heater system.



CORHART REFRACTORIES COMPANY

Subsidiary of Corning Glass Works

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Sampler design . . .

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the hopper it is gripped by a revolving coarse crushing nut and roughly crushed against the top crushing liners. It then passes by gravity to the revolving fine-toothed crushing disc and stationary liner where the crushing action is finished. Because of this gradual reduction process and the rotating crushing action, it is thoroughly blended, presenting a homogeneous, finely disintegrated mixture of the crushed stone.

This finely crushed material, minus-8 mesh, is uniformly discharged at the periphery of the rotating disc where 5 percent of the circumferential discharge is caught and passed by gravity through

the independent, small, sample spout. This sample then goes to an additional sample splitter (Fig. 9b) which discharges 5 percent of the initial 5 percent sample. The surplus material discharges through the large inclined spout. The capacity of the crusher is 1 tph. of minus-8 mesh material. According to the plant personnel, the sampler is working satisfactorily and efficiently.

The Vezin sampler (Fig. 10) consists of a revolving cutter in the shape of a circular sector of such dimensions as to cut the whole stream. When properly built, i.e., when the cutting sector or sectors are shaped with their center at the center of revolution of the sampler, an accurate sample is obtained. In addition, the cutting sector must be at least three to four times as wide as the coarsest particles are wide, in order to avoid clogging. A Vezin sampler operating at uniform speed across a stream will only take a representative sample if the stream which it cuts is of uniform thickness.

Usual samples obtained by Vezin-type samplers are $\frac{1}{5}$ to $\frac{1}{20}$ of the material stream. By making another sample cut, a $\frac{1}{25}$ to $\frac{1}{400}$ sample of the original stream may be obtained.

The commercial Vezin sampler consists of a sheet-metal housing containing a rotating cylinder having one or more scoops secured to it. The cylinder and the scoops are made of sheet steel and the cylinder is mounted upon a vertical shaft which usually has an individual electric motor drive. The entire mechanism is supported in a welded steel frame and the housing forms a hopper at the bottom for receiving rejects from the sampler.

In operation, the cylinder and scoops revolve slowly, causing the scoops to pass under the end of the chute discharging the stream being sampled. The scoops cut out the sample passing through the material stream. The sample passes through the revolving element, and it is conducted by a pipe or chute to units which prepare or reduce the sample for testing or study. The rejects fall into the hopper from whence they continue their flow through the process.

Plant J uses a commercial Vezin sampler similar to Fig. 11 to sample raw and finish mill products. This sampler makes a complete cut in the mill stream at selected time intervals. According to the plant personnel it is doing a remarkable job in furnishing a very representative and accurate sample, and they are well pleased with its performance. Several revisions were made to the cut-

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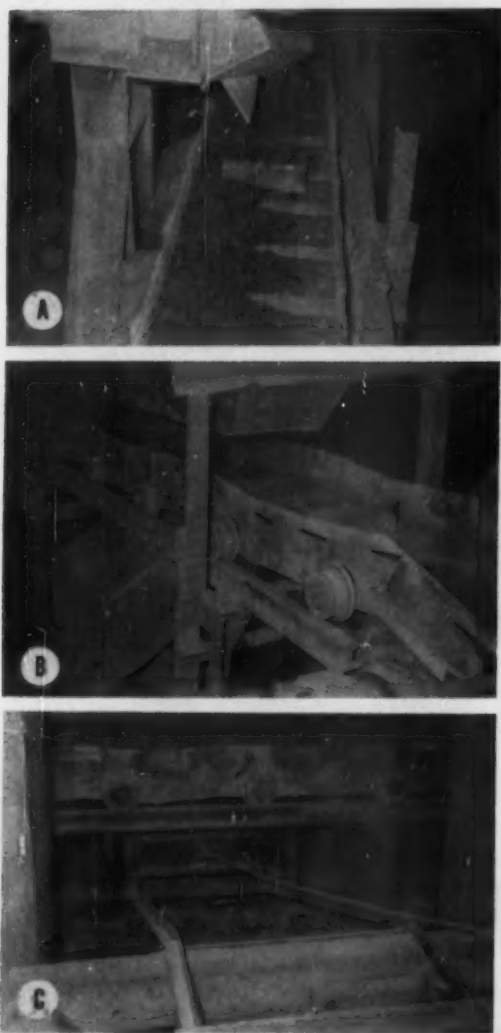


Fig. 13—Raised slot sampler; (A) top view, (B) side view, (C) sampler box

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Faced with the decision to expand your plant facilities, you should first determine whether all elements combine to form a pattern of future profitability. Independent analysis of all aspects of your proposed program is the *Pre-Engineering* service offered by Kaiser Engineers. The studies and evaluations furnished by KE Pre-Engineering represent only one phase of total KE services. Kaiser Engineers is an experienced designer and builder of all types of facilities for the Minerals industry. From Pre-Engineering through design and construction, Kaiser Engineers provides complete one-company service and ingenuity based on years of experience.



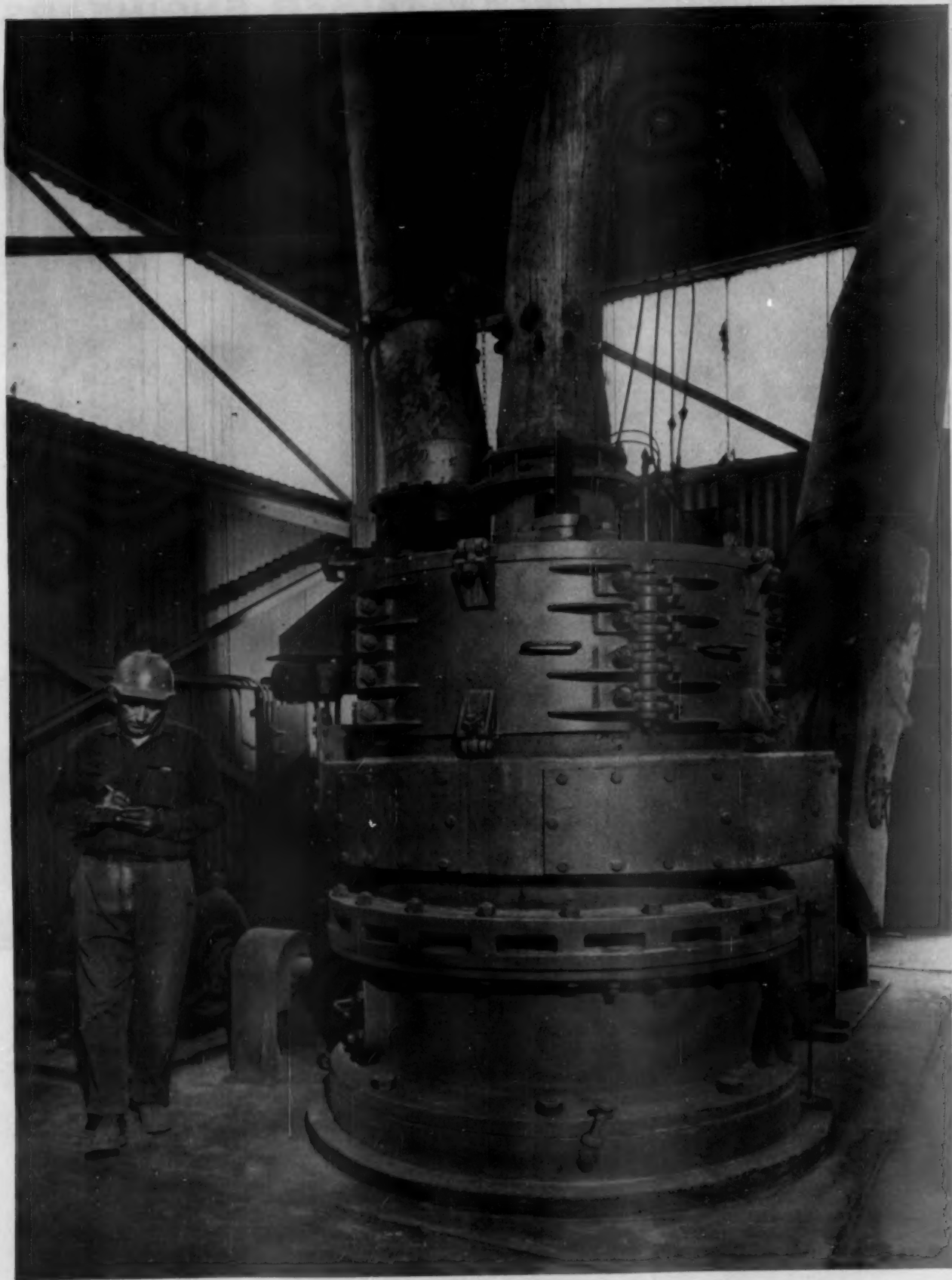
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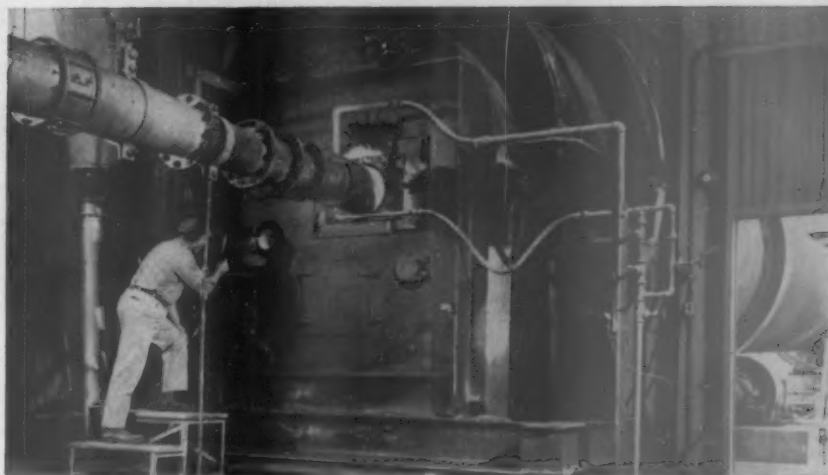
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Fifty-fifty mixture of high moisture content anthracite and bituminous coal is easily ground and dried by B&W EL-35 pulverizer shown at left.

Full capacity is assured by uniform fineness and efficient firing of coal mixture to 10½ by 150-foot cement kiln (right).



Hard Coal and Soft...

This B&W dual-fuel pulverizer grinds both at the same time, with maximum availability and continuous service

This B&W EL 35 pulverizer, in its 4 years of operation at the Whitehall Cement Manufacturing Company, Cementon, Pennsylvania, has given maximum availability and continuous service grinding a fifty-fifty mixture of anthracite and bituminous coal, with respective moisture contents of 12% and 6%. B&W pulverizers deliver, dry and preheated, any grade of coal with moisture content as high as 20%. Uniform fineness and full capacity are maintained with this coal mixture direct fired into a kiln producing 2,800 barrels per day.

Operating and maintenance costs are low. Grinding elements maintain full contact for maximum production throughout their long lifetime. High quality clinker production is assured with a fully automatic control system which accurately maintains optimum kiln combustion conditions. The efficiency of this direct firing system has contributed to the exceptionally low coal rate of only 44.5 lb/bbl (585,000 Btu/bbl).

With soundly engineered products such as this, B&W develops more efficient fuel firing equipment for industry throughout the world. For additional information on B&W direct firing systems for rotary kilns, write for Bulletin C12. The Babcock & Wilcox Company, Boiler Division, Barberton, Ohio.



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Efficient, automatic control is fully maintained from centrally located instrument console equipped with Bailey Meters.

Top performance direct-firing is obtained from six additional B&W EL pulverizers feeding smaller kilns with the same fifty-fifty coal mixture.



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*What looks like a trivial error
can really knock the bottom
out of your profits!*

PRODUCERS: *scale* WATCH YOUR [^]WEIGHT!

by Pat Thomson*

ARE YOU ONE OF THOSE PRODUCERS who feels that a weighing error of a fraction of a ton is inconsequential? You're in for a rude jolt. For that error, multiplied by the hundreds of times the trucks go over the scales, can soon amount to an astronomical figure.

The huge scale of one crushing company in central Washington was found to be weighing about 800 lb. short for every 14½-ton load. At an average of 151 loads per 9-hr. shift hauled on the road, the company was losing 60.4 tons of aggregate credit per shift. At a price of \$3.25 per delivered ton on the roadway, this company was losing about \$194.30 per shift in actual delivered products. Further multiply this by the four weeks

*County Engineer, Douglas County, Wenatchee, Wash.

necessary to do the job, and the company had a potential loss of about \$9,000. Under present bidding conditions perhaps some companies can afford this, but I doubt it.

Is this an unusual case? I would question that. About two weeks later another crushing operator moved in on a different project. After checking his portable scales thoroughly, we discovered that he was weighing about 1 ton short per 30-ton load. In the first 30,000-ton stockpile, we could have gained about 1,000 tons at the price of \$1.65 per ton delivered in the stockpile.

Normally, a faulty scale will make its error in only one direction. If in overweight, it costs the company money in unpaid-for products that have been delivered. In shortweight, it costs the com-

Please turn to page 124

This properly set up scale is out of the line of traffic and has been completely inspected. Both the producer and the county are assured that it is accurate





19 tons of sub-base material loaded in 1.4 minutes!

To be exact, 19.75 tons of 3000 lb./yd. material loaded in that truck in 1.4 minutes. No one-time-only shot either. Another example: five trucks loaded out one after the other in 1.3 minutes each with an average of 17 tons per truck. That's routine production for the Caterpillar 966 with 2¾ yd. bucket at the Nello L. Teer quarry near Durham, N. C.

Can your loader match that? This 966 operator said, "I can load up to 100 tons an hour *more* with the 966 than with our other loader with a bigger bucket."

Reasons: "It's the fast lift and drop of the bucket, fast steering and short turning radius, fast power shift transmission and the automatic bucket positioners." There are hard mechanical reasons behind that performance testimony. The hydraulic system is fast because the pump is driven directly from the engine, is little affected by the load on the drive train. Finger-touch power shift transmission shifts from forward to reverse, first and second, almost instantly and *smoothly*.

If low production is your big problem, talk to your Caterpillar Dealer. Take a look at the Caterpillar line of wheel loaders—80 HP 922, 105 HP 944 and the 140 HP 966 (all flywheel ratings) . . . bucket sizes from 1¼ to 4 yd. Try a Cat loader on your job, see the easy operation, check the production, remember Cat dependability. Do you know anything that can beat that combination?

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.



WHY THE BUCKET'S FASTER: It's going up automatically, will stop and hold at full height—while the operator is backing out and pulling up to the truck. After the load is dumped automatic bucket positioners take over again and tilt the bucket back to proper digging angle—and the operator is free to maneuver the loader. It's all part of the fast-operating control system—power-boosted steering and brakes, power shift transmission.

CATERPILLAR

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**CAT WHEEL LOADERS
ARE SETTING NEW
PRODUCTION RECORDS**

Watch your scale weight!

continued from page 122



When 14 tons hit the scale, this producer will get 14 tons of credit on the tonnage slip. The careful driver has eased onto the scale, rather than "cowboying" the rig to a bucking halt and disrupting the whole setup

pany money in the loss of business reputation and bad public relations. This could mean the expenditure of thousands of dollars in advertising to regain lost company prestige in the bidding world. In the aggregate production business, you are made aware daily that your materials are bought, graded, sold, produced, counted and paid for on the basis of scale weight determination. Therefore, we do not have to stress the importance of scales in the handling of your materials. However, because the scales you use are large, and often frequently relocated, familiarity can breed contempt.

Scales have been around a long time. The first was recorded about 5,000 B.C., with the primitive equal arm hanging from a central pivot. Motor truck scales evolved from the early wagon scales. The movable pitless-type models used by crushing contractors were constructed to meet the needs of quarry and crushing producers who had weighing problems involving smaller loads than permanent installations, and who had to move from one job to another.

However, I have seen producers with scales I would have sworn were purchased from the Egyptian Pharaohs. Many operators feel that any scale is sufficient, just so it has adequate capacity. They do not realize that obsolescence may be the most expensive way to weigh in cost of labor and time.

Scale companies have manufactured improved designs, suiting the scale to the purpose.

The portable-type platform scale has been readily adaptable to the crushing system where numerous moves are indicated. But because of the size, personnel often forget that scales are still precision instruments, as delicate and accurately made as a wrist watch. Scale tolerance has an accuracy of one ten-thousandth of an inch in some parts. Rough handling, hard knocks, and abuse can easily destroy this precision.

In the establishment of portable scales on a long-range project, we would require concrete piers. Generally, however, the short duration of the project does not warrant this expenditure. With a firm bearing, a heavy timber crib is satisfactory. The scale must be solid, so there is no deflection under the load. It must be set level from end to end and side to side. Our requirements state that if the platform is set level or above ground, straight approaches must be provided in the same plane as the platform for a distance equal to the platform or 40 ft., whichever is least. If the approaches to the scale are bad, causing a heavy impact when the truck hits the platform, accelerated wear of the pivots and bearings will result. The weighing unit must be out of the general line of traffic, so that those trucks which do not have to be weighed, or empty, returning vehicles, do not have to pass over the scales.

The manufacturer of any scale provides installation instructions and moving rules. Failure to comply with them has often resulted in misuse of scales and permanent damage to the mechanism. The scale manufacturer builds his entire experience into his new design, and the producer can save himself many expensive headaches by paying attention to the method of erection the manufacturer knows is best for his unit.

Not performing preventative maintenance on your scales is the grossest of false economy. They should be kept as clean as possible at all times. Spilled aggregates should not be allowed to collect between the edge of the platform and the pit coping. Even on short-time portable scales, the installation pit should be cleared of excess dirt, stones and sticks. In one instance, the testing of a portable platform scale weighing out $\frac{5}{8}$ to $\frac{1}{4}$ -in. seal coat material at a price of \$1.89 per ton was done on all four corners and the center. This particular scale tested fine on three corners and the

Please turn to page 126



How Missouri Portland gets 50 percent less breakage with bags of **EXPANDA-KRAFT®**

"We've switched to extensible bags of Expanda-Kraft," says Mr. W. H. Strube, Purchasing Agent, Missouri Portland Cement Company of St. Louis.

"Recently, we compared the strength of regular kraft and extensible kraft bags in transit. Half of a boxcar was loaded lengthwise with regular kraft and the other half with Expanda-Kraft bags. We repeated this test on several shipments (about 1200 bags were tested each time). Result: Expanda-Kraft breakage was half that of regular kraft."

Expanda-Kraft is extra tough because it's made by H&W's roll-crepe process. This production technique gives it two-way stretch. In fact, Expanda-

Kraft has the *highest cross-direction stretch* of the leading extensible papers now on the market. It can absorb rough impacts from any direction.

H&W does not make bags. But we'll be glad to put you in touch with reliable bag manufacturers. For information and samples, write Hollingsworth & Whitney, 230 Park Avenue, New York 17, N.Y., or 111 West Washington Street, Chicago 2, Illinois.

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Watch your scale weight!

continued from page 124

center, but did not even register a flicker when tested on the fourth corner. The crushing plant operator immediately turned green, for he already had put over 400 loads of aggregate over that scale. And, obviously, he had cost his company money, for everything weighed in the defective quarter of the scale did not register. What caused this mishap? In the hurry to save installation labor, a rock was left under the corner and it could not go down. This was a pretty expensive lesson!

Most units have compressed air available at the plant site. So it is a simple matter to blow out the dust that sometimes accumulates and gums up the scale works. It doesn't hurt occasionally to blow out the base of the scale either.

It is generally recommended that a long-fibre grease be packed around the pivots and bearings underneath the scale platform. This is not for the purpose of lubrication, but is intended to keep out an accumulation of dirt and moisture around these parts. All the steel parts of the scale should be painted as directed. And there should be a periodic check for wear of the pivots and bearings.

Even though the manufacturers use the finest of materials in their scales, they are not constructed to withstand the "cowboy" driver who barrels onto the scale, braking to a screeching halt on the platform. One such stop can knock the precision elements out of alignment, so that any plant

When the office engineer and his adding machine team up on those tonnage sheets, it's already too late to do anything about your scale errors



operator should demand careful driving of the load upon the platform. Bearings and knife edges should be cleaned with kerosene and a wire brush. The dash pots should be filled or the oil seals filled to proper levels.

Stay away from the jack-of-all-trades or the "alley" mechanic, should your scale need repairs. In one instance, a company had a scale repaired, but still suspected that something was wrong. A legitimate inspector discovered that a steel ribbon which had broken had been repaired by cutting a strip from an abandoned coffee can. This "hunk of tin" had been fastened to the cam and the weighing results were actually worse than guesswork. In another instance, one company let their plant man work on a scale and ended up by junking it, purchasing a new one. Yet in two hours, a competent scale man put the junked scale back into legitimate operation.

Crushing companies often resent the fact that we ask for scales to be tested, holding up operations for a day. But this is an area of cooperation that should be increased. For a tested, sealed scale is the crushing organization's assurance that they are giving full tonnage. Actually, the call to test your scales is doing you a favor, unless you are deliberately trying to defraud. The scale is only a mechanical device. It does get out of order and, all too often, the crushing company is on the short end of the weight. Crushing operators, weights and measures inspectors, and scale manufacturers should all have the common objective of providing adequate weighing service to the buying highway agency.

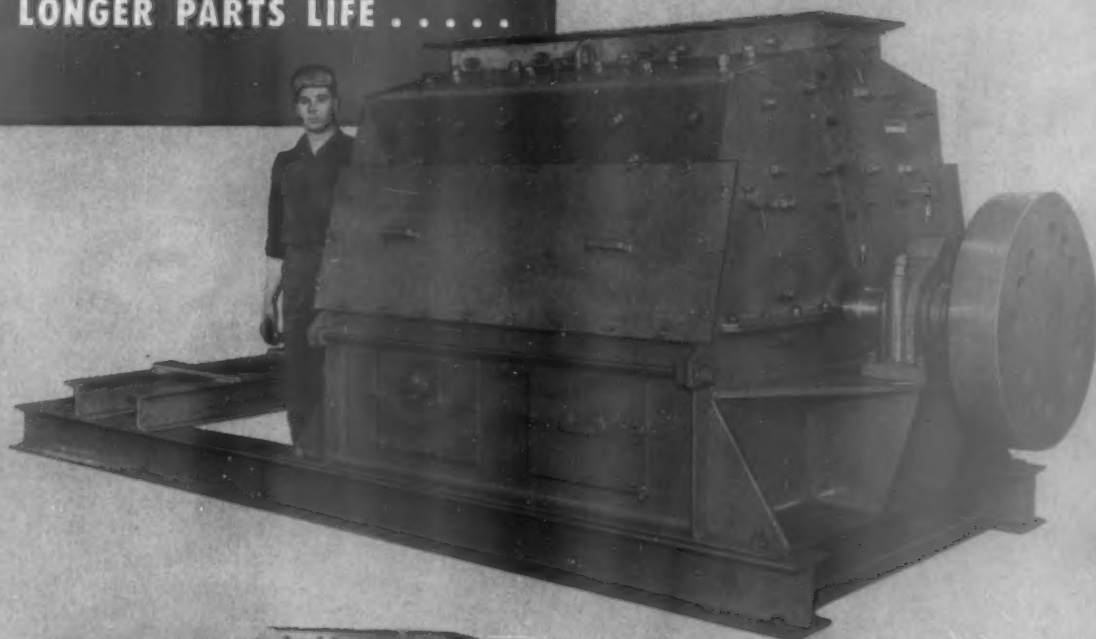
Strict inspection also aids the crushing companies in that it weeds out the fly-by-night scale and meter mechanics. It ensures that the repair companies will do a good job, working to a closer tolerance. This, in turn, ensures that the scale equipment will stay within maintenance tolerances longer. Companies save money and keep the scale equipment in better condition.

So if you have any doubts that the field plant man should have some knowledge of scales, their uses, and simple facts about their care, check these points. This scale know-how can save you money, make your operations faster, save you expensive man-hours of labor, conserve your product and simplify your record keeping. All of this helps your company show a better profit at the end of your project. And if that doesn't mean additional salary in your pocket, then you had better change companies.

END

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It's another Williams "first"—features not available in other hammer mills—that now makes it possible to maintain the original close clearances of *both* grinding plates *AND* cage sections against the rotating hammers. This easy-to-make "2-point" adjustment, in the most critical grinding area inside the hammer mill, gives absolute assurance of consistently uniform product quality.

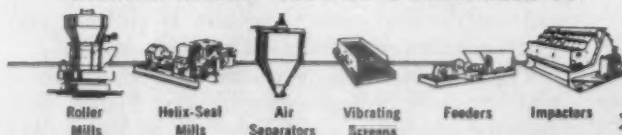
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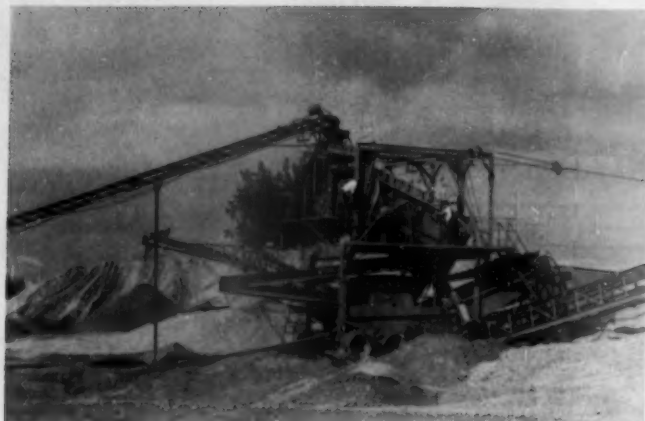
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All-in-one washing plant hits the road

by John H. Bergstrom

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on one 26-foot chassis*



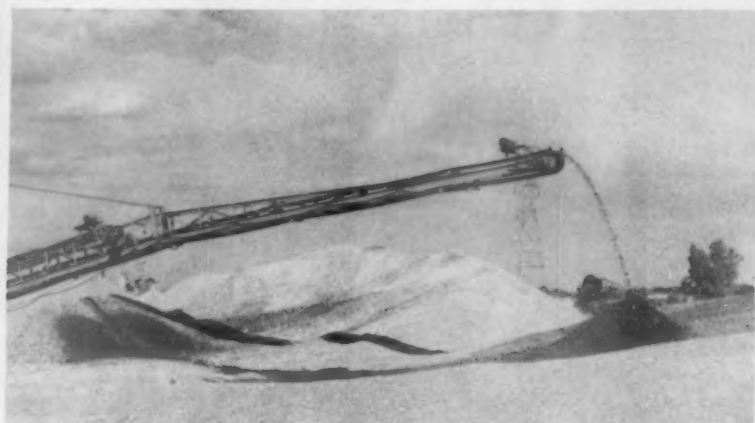
AT FIRST GLANCE it looks like the most unlikely rig that ever traveled a public highway. But a closer look reveals that the new portable operated by the Brannan Sand & Gravel Co., Denver, Colo., is a unique and efficient washing plant, ideally suited to the conditions encountered by Brannan in the Denver area. Operations at most sites are of limited duration either because of local zoning requirements or the scarcity of high-grade deposits, making a portable plant the practical answer. It is usually in operation three or four months before moving to another site.

With an over-all height of 28 ft., 4 in., and a base length of only 26 ft., the unit has a decidedly top-heavy appearance. Two stacking conveyors reaching 100 ft. to each side add to the plant's strikingly "unportable" look. But appearances are deceiving. Knocked down, it's as roadable as most conventional designs—more so than many.

But first let's look at it in operating position. Designwise, it is actually a portable screening tower built on two levels. The top deck consists of two separate steel frames mounting a pair of 5 x 12-ft. triple-deck wash screens. Each section, including the lightweight steel catwalk running completely around the outside, is 8 ft. in over-all width. Both units are bolted on top of a similar steel frame running the full width of a three-axle trailer chassis. The chassis is 12 ft., 11 in. wide, so when assembled the top deck overhangs approximately the width of the catwalks.

Mounted within the steel supporting frame welded to the chassis is a twin 30-in. sand drag. A small doghouse contains all electrical connections and control equipment. The unit is entirely prewired, with all cables encased in steel conduit.

The material handling system incorporates some truly unusual design concepts. Two 100-ft. long stacking conveyors rest in saddles welded to the



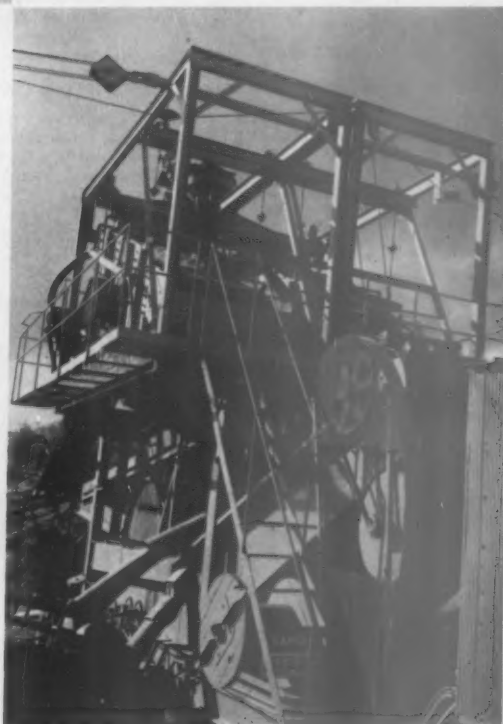
Left: The complete washing and screening plant unfolds its long conveyors like tentacles to build deep storage piles

trailer chassis, supported at midpoint by a cable from the top deck frame. Above-ground height of the conveyors is controlled by a winch also supplied by two more steel cables fastened at either end of the trailer.

Each stacking conveyor handles two products simultaneously. The first 50 ft. of the conveyor truss contains two belts—one above the other. The top belt extends only 50 ft. and creates a stockpile at this point. The bottom belt runs the full 100-ft. length of the stacker and creates a pile at its end. The belts are only 12 in. wide, but have a 2-in. rubber flange molded to the belt itself. Both run on flat idlers spaced at 7-ft. intervals. Because of the additional speed and capacity provided by the flanged belt, Brannan officials estimate the 12-in. stackers have the same capacity as 24-in. units incorporating conventional belts. The sand belt is operating at the impressive speed of 740 fpm.

Feed for the washing plant is supplied at 250 tph. by a standard portable crushing unit. The minus 1½-in. feed is split between two 5 x 12-ft. triple-deck washing screens. The screens produce three sizes of washed rock, which are conveyed directly to storage: 1½ x ¾-in.; ¾ x ½-in., and ½-in. x No. 4.

The minus No. 4 sand passing the third deck is further washed in a twin 30-in. drag classifier. The sand originally dropped directly from the screens to the classifier below; however, this created too much turbulence in the classifier for effective classification and was modified. Now a flume, shaped like a narrow "V" on its side and projecting about 10 ft. to the rear of the trailer, slows down the sand before it reaches the classifier. The flume is also used to reclaim gold when the plant is working a gold-bearing deposit. Gold recovery will often amount to as much as 5 or 6¢ per ton. Future plans



Below: A pair of washing screens separates sand from gravel as the first step in the process

include construction of a crushing plant custom tailored to the needs of the washing plant.

Disassembly, transportation and re-assembly take less than one week. Both top sections containing the wash screens are unbolted, lifted down from their supports on the main chassis and placed end-to-end on a low-boy.

Next step in preparing the rig to roll is disassembly of the stacking conveyors. They are both hinged at their midpoints, allowing the 100-ft. units to be folded in half for hauling. Normally, the conveyors are transported by supporting one end of the fifth wheel of a truck and placing wheels under the trailing end.

Please turn page

All-in-one washing plant . . .

continued from page 129

The entire plant, with the exception of the vibrating screens, but including the trailer chassis, was designed and constructed in Brannan's own shops.

END

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Bulldozer	Caterpillar Tractor Co.
Tractor loader, 2-cu. yd.	Clark Equipment Co.
Portable crushing plant	Iowa Mfg. Co.
Vibrating screens, 5 x 12-ft. TD., (2)	Allis-Chalmers
Twin sand drag, 30-in.	Brannan Sand & Gravel Co.
Conveyor idlers	Stephens-Adamson Mfg. Co.
Conveyor belting	Mono-belt Inc.

Right: The V-shaped elbow projecting from the tower is the sluice that takes sand and water from the screens to the sand drag

Below: Here's how the big portable washing plant (center) fits into Brannan's layout of portable belt conveyors and portable crushing rig (left)



A sand-washing drag is tucked away under the two washing screens. It discharges to another stacking conveyor (out of sight)

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Electrical engineers probe cement industry problems

PEOPLE ARE IMPORTANT." Good maintenance depends upon the enthusiasm and interest of the people who head up the maintenance program in any cement plant. These were the ideas that key-noted the third annual AIEE Cement Industry conference in Detroit. Ray E. Stroppel declared that the inadequacy of many a maintenance program may be laid directly to poor communications between top management and the maintenance supervisor. The lack of communication may be due to the fact that maintenance men and others may not be considered as part of the management group.

While this was one of the most challenging issues raised at the conference in April, it was only one of the 15 papers that penetrated the four major problem areas facing cement producers—accidents, automation, machine design and the distribution of power.

There were more than 300 representatives of portland cement producers to this, the largest and perhaps only, public forum discussing the workings of the portland cement industry. This annual meeting has become so important and useful that it regularly attracts engineers and production men from all over the United States, Canada and Mexico. Plans and programs for the next meeting in St. Louis, Missouri, are already developed for April 3 to 5, 1962.



The Permanence of Change was the topic developed by C. B. Baker, president, Universal Atlas Cement Div., U.S. Steel, at the Conference's annual banquet

Roblee B. Martin, president of Dundee Cement, outlined the problem of where to locate a new cement plant



Progress reports on recommended standard practices for the cement industry were offered in addition to the papers on different phases of cement production. These reports represented the efforts of committees that met during the year to discuss electrical safety, electrical drives, power distribution and automatic controls.

Centralized controls in the far-flung Ideal Cement Co. were discussed at length by W. Walkling, Ideal's head electrical engineer. This company has three plants successfully using centralized control (Houston, Ada and Tijeras). Electronic instruments and controls permit one man at a central control console to supervise the operation of each of these plants. The result has been a better and more uniform product, lower maintenance expense and the increased availability of production equipment.

The electrical engineer's interest in safety ranges far beyond electrical safety alone. However, electrical safety in the cement industry is a critical part of each plant's safety program. J.R.D. Brown of the Portland Cement Association pointed out that electrical accidents are noted for severity rather than the number of fatalities. This should require more vigilance, for severe accidents can just as easily become fatal accidents.

How much money can be profitably invested in a safety program? Several studies have shown that savings of \$4 can be achieved for every dollar spent for an accident prevention program. Cement makers have few other opportunities to invest money more wisely or more profitably and

Please turn to page 134

10 ways Du Pont can help you break more rock per dollar



It's not the cost of loading a hole that counts in quarry blasting... it's the cost of getting out a ton of rock. That's why the really successful quarry men look long and hard for top quality explosives.

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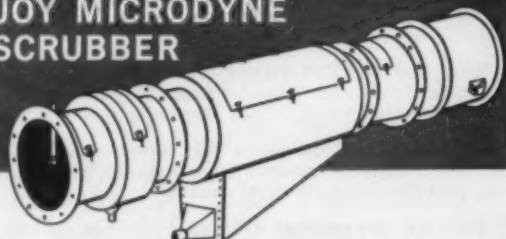
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AIEE Conference . . .

continued from page 132

this is still true in an industry noted for its excellent safety record.

What do accidents cost? They cost far more than the obvious, out-of-pocket expenses and the loss of income to the worker. Indirect costs, hidden expenses and loss of productivity can often be up to three times the "insured" costs represented by workman's compensation.

Moving from the area of costs to the very practical things a cement company can do to reduce accidents, E. E. Wilken of Nazareth Cement Co. outlined his company's achievements in improving safety in every part of the plant. Personnel practices included training qualified personnel in safe operating procedures in every part of the plant with frequent retraining in the use of both new and old safety equipment and the installation of mechanical devices as grounds and safety lock-outs on all machinery.

Two outstanding speakers discussed two different facets of the cement industry in the United States. Roblee B. Martin, president of Dundee Cement Co., discussed some of the economic reasons his company built a cement plant at Dundee, Mich. This plant was later visited by those who attended the conference. Featured speaker at the banquet was C. B. Baker, president of Universal Atlas Cement Div., U. S. Steel Corp.

END

New research lab . . .

continued from page 104

Acme air-meter, for determining air content of portland cement concrete.

Vibrator, laboratory, Stow Model DUA, 8,800 rpm., 7/8-in. head.

Proctor needle penetrometer test apparatus to determine rate of hardening of portland cement mortars.

Sand equivalent test apparatus, to show relative proportions of fine dust or clay-like materials in fine aggregate. State of California test method 217-C.

Gauge, strain, soiltest, multi-position, Model CT-171. Readings can be made to .0001 in. For use in shrinkage tests in block, measuring opening or closing of structural cracks, measuring relative displacements in structures, etc.

Gauge, expansion bar, modified to accept 8 x 8 x 16-in. masonry block; reference points end-set.

Microscope, Bausch & Lomb, optical, with 3-position objective head, 430X magnification.

Temperature recorder, Leeds-Northrup, speedo-max, 0-300 deg. F. range.

Temperature recorder, Foxboro, bulb type with 15-ft. lead, 0-100 deg. C. range.

END



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This phosphate coating has another important advantage.

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Phosphate coating is just one of the "extras" in National seals. And with National you choose from a complete line with both Syntech rubber and Micro-Torc® leather seals in practically every type and size. When you need seals . . . get the best. Call your National Seal Distributor.



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Sampler design . . .

continued from page 118

ter opening and to the discharge spout in order to improve the performance. The ready availability of the cutter for visual inspection and maintenance has reduced the plant's maintenance on automatic samplers.

Plant K has a commercial Vezin 40-in. simplex sampler similar to Fig. 12, but it has not been used long enough for the plant personnel to judge its efficiency.

Plant L also has a sampler similar to Fig. 12. The plant personnel feel that it is not doing as good a job as was expected, due to problems arising from mechanical failures.

Raised-slot sampler is used at Plant M for the clinker from a pan conveyor coming from the clinker coolers. The sampler, a 1 x 12-in. raised slot, passes through the clinker stream from each cooler once every 11 min. The slot is cut out of one of the pans of the conveyor, and its built-up sides are welded to the pan. Directly below the clinker stream is a box to catch the clinker that passes through the slot. Three times daily, at the end of each shift, the sample box is emptied and tests are run on a composite of the 11-min. samples. This sampler is shown in Fig. 13.

According to the plant personnel this device obtains a good representative sample. One disadvantage is the possibility of contaminating the clinker in the first sample box. Fine material at times filters through the pan section and is collected on the bottom of the returning pan directly below. As any section of the pan rides around the sprocket, it deposits some of the material into the sample box which, in this case, is in close proximity to the change of direction of the pan.

My investigation indicates that none of the automatic samplers now available and in use by the cement industry is uniformly regarded by mill operators as adequately reliable and efficient. A prime drawback of many existing samplers is that truly representative samples are not obtained.

To achieve the ideal automatic sampler means designing, developing, field trials and possible re-designing until the end result is obtained. **END**

Rocky's Notes

continued from page 21

one and some the other. His conclusion is: "These data indicate that the settling time of calcium hydroxide can be controlled by choosing a combination of initial water temperature between 4 deg. C. and a temperature producing a final temperature less than 212 deg. F., and a ratio of water to

Please turn to page 138

ROCK WRITES THE "SPECS"—LORAIN MEETS THEM



Hinkle Contracting Corp., Paris, Kentucky use their Lorain-56 shovel at the face of the Farmers Rock Quarry to load trucks with up to 800 tons of rock a day for hauling to the crusher.



This Lorain-56 is used also as a dragline in the pit of Opitz Sand & Gravel Co., Denton, Texas. They say, "We are very well pleased with our '56' and like the 'Shear-Ball' connection very much. No center pin, bushings, rollers to fool with. It's a saving for sure."

Whether at the quarry face as a shovel, or stockpiling or loading sand and gravel as a clamshell, the 1¼-yd. Lorain-56 is built for high production and rugged service. It is fast, smooth, sturdy, and requires a minimum of maintenance.

The Lorain-56 has many features that make it a high producer on any pit or quarry operation. It does more, faster, for less. Here is why.

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PLANTS in Lorain and Elyria, Ohio.

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OUTLETS—Lorain products sold and serviced by 249 distributor outlets throughout the world.

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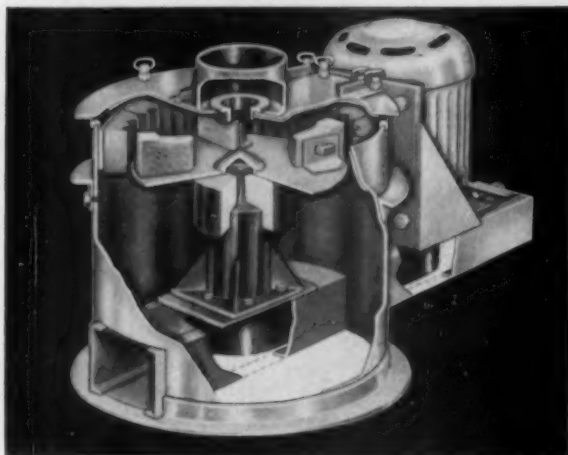
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enthusiastic users say the

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SQUARE IMPACT CRUSHER

turns out a dense graded cubical product—yet it is the most versatile crusher ever put on the market. Produces any range of crushing, to screen



to any gradation required, in an almost unbelievable number of tons per hour, and does it at less cost than Rod Mills or other types of Crushers priced up to **TEN TIMES AS MUCH!**

Virtually no "down time"—you can keep it in operation 22½ hours a day, 7 days a week, year after year.

Light in weight—requires no massive foundation and little head room. Power requirement amazingly low. No zincing or babbitting needed.

Write, wire, or phone collect for details. We'll run a sample of your own material through the Tornado to **PROVE** how much it will do for you.



WERCO Steel Company

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Cable Address, IMPACTOR

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138

Rocky's Notes

continued from page 136

calcium oxide to give the desired characteristic."

Stated mathematically, the law or formula is:

$$H = W (T_1 - T_2) + W'h' (T_1' - T_2')$$

Where H — the heat in Btu.

W — weight of water

h — heat capacity of water — 1

T₁ — initial temperature of water

T₂ — final temperature of water

W' — weight of calcium hydroxide

h' — heat capacity of hydroxide — 0.29

T₁' — initial temperature of suspension

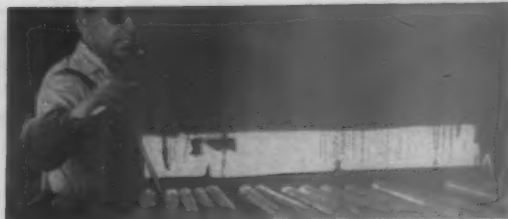
T₂' — final temperature of suspension

Since the theoretical heat of the reaction for a constant weight of CaO is known, and the weight of Ca(OH)₂ formed, the formula may be solved for T₁ or T₂, for any given ratio (R) of water to lime. These values were determined for ratios of R from 2.5 to 25. The object of using the formula and tables is to keep within the 212 deg. F. limit.

Some of his results are not what might have been anticipated. For example: "The specific surface decreases (mean particle diameter increases) for all initial water temperatures to 60 deg. C. as the ratio (R) of water to lime increases from 2.5 to 25. Also, the specific surface increases (mean particle diameter decreases) for each value of R as the initial water temperature increases. The calcium hydroxides with the highest specific surface areas were obtained from those tests producing final temperatures of or greater than 212 deg. F. (boiling temperature of water). These temperatures were obtained with R at 2.5 for all initial slaking water temperatures investigated and for an initial slaking water temperature of 90 deg. C. at all values of R. The development of specific surface of a calcium hydroxide is, therefore, a function of the final slaking temperature. Final slaking temperatures less than 100 deg. C. (212 deg. F.) develop the specific surface of calcium hydroxide in proportion to the final temperature, which is another way of defining the ratio R of water to lime. Higher ratios resulting in lower final temperatures produce the lower specific surfaces, and low ratios of water resulting in higher final temperatures produce higher specific surfaces."

Another interesting conclusion is: "Suspensions produced at all values of R with an initial temperature of the water at 194 deg. F. (90 deg. C.) contained large amounts of crystalline calcium hydroxide, which accounts in part for the very high specific surface areas. Crystallization also increases the settling time. The initial slaking temperature should be chosen to assure a final slaking temperature of 212 deg. F. or less to prevent, or reduce to a minimum, the opportunity

Please turn to page 140



don't
grind
up
profits



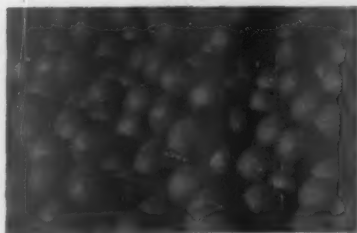
In any milling operation, the performance of grinding balls can affect profit margins. Coates Grinding Balls have been proven by actual production runs to out-perform, out-last others costing much more.

Coates, manufacturers of grinding balls exclusively, has its entire factory geared to turn out a superior product. Know-how and skills, developed over years, forge bars of special formula, fine-grained, high-carbon steel into perfect spheres of rugged steel. Triple-forged and carefully heat-treated to exactly the right degree of hardness for long wear and toughness that withstands milling strains without shattering, Coates Grinding Balls are your best buy.

Specify Coates Triple-Forged Carbex Grinding Balls crafted with care from start to finish to give you *More Milling Mileage*.



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LARGEST EXCLUSIVE MANUFACTURER OF GRINDING MEDIA

THE O'NEILL HYDRAULIC JAW CRUSHER

• custom-tailored to
the requirements of
low-tonnage users at

**AMAZING
LOW COST!**

For the producer who requires medium primary crushing capacity and large top-size at the lowest cost, the answer is the trouble-free O'NEILL HYDRAULIC JAW CRUSHER, manufactured to the specific operating requirements of the medium or low-tonnage producer . . . assuring size capacities that magnify your present plant production . . . with versatility to handle many types of material, including hard or abrasive rock. The O'NEILL HYDRAULIC JAW CRUSHER is available with electric or gas-engine drive.

Welded steel construction has either replaceable cast manganese steel liners or welded hard-faced steel wearing surfaces. Over-size, low-pressure, low-maintenance hydraulic cylinder drive eliminates minimum operating speed requirements—eliminates chance of damage from tramp iron. The movable breaker plate is easily detached for maintenance purposes, and there are no high-cost roller bearing assemblies to worry about.

For Example

Custom-tailored to these specifications:

THROAT: 42" x 60" DEPTH: 72" MOTOR: 5
HP CAPACITY: 100 cu. yds. per hr. (Light-weight Clinker)

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WEST VIRGINIA

\$9500.00

The O'NEILL HYDRAULIC JAW CRUSHER can be designed as an integral part of the feeding hopper. Completely eliminates the need for costly extra "shooting" or pre-crush breaking with a headache ball. And every order is ESPECIALLY DESIGNED TO YOUR SPECIFIC REQUIREMENTS!

Versatile - Will Crush

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- CLINKER • SHALE
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Rocky's Notes

continued from page 138

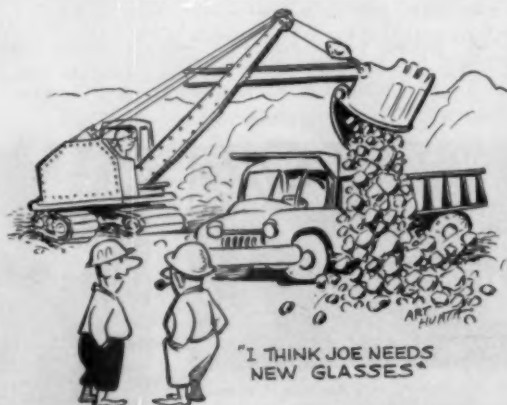
for crystal growth. The viscosity increased with an increase in temperature for a constant water ratio. When the water ratio was increased and the initial temperature of the water increased to produce a final temperature approaching 212 deg. F., the viscosity decreased at a very rapid rate."

The importance of this viscosity factor in most industrial uses of hydrated lime is brought out thus: "The higher viscosities of suspensions with water ratios of 2.5 indicate a change in the physical properties [at that concentration], which will decrease the settling time. Therefore, the settling time is not dependent upon mean particle diameter (or specific surface) of the suspended calcium hydroxide alone."

Elsewhere, Miller writes: "Aqueous suspensions of calcium hydroxide exposed to heated bodies above 214 deg. F. have been shown to produce hexagonal crystals of fairly large size. The specific surface area of these suspensions increases as crystallization increases because of the colloidal characteristics of aqueous suspensions of crystalline calcium hydroxide."

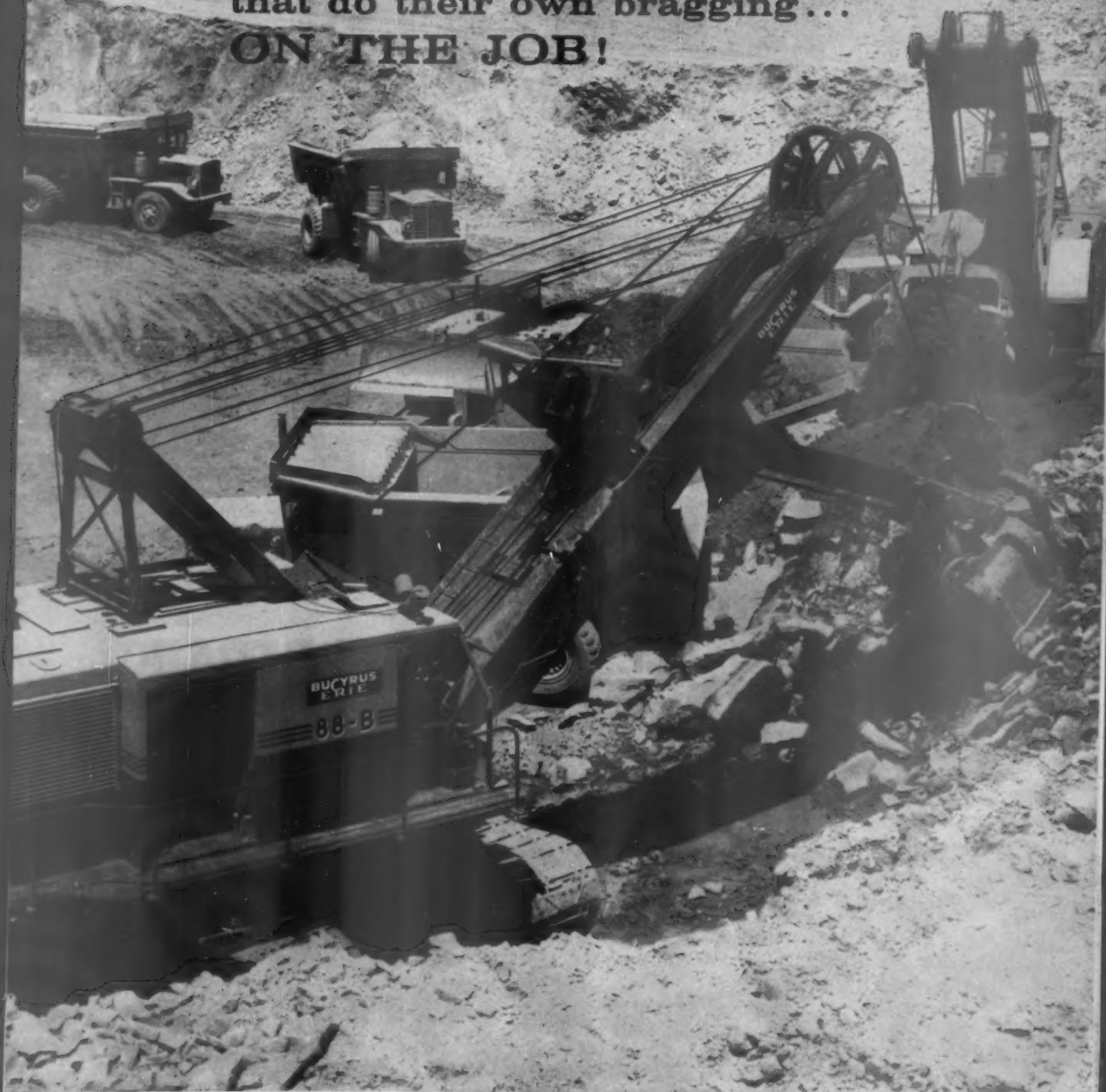
Does this research have any interest except to manufacturers of lime and users of lime suspensions? Most assuredly, we think. To our way of thinking, the hydration of portland cement is primarily hydration of the lime temporarily bound up in the clinker particles of an unstable silicate. Proof of this seems obvious when it is shown that the heat generated in the hydration of cement is directly proportional to and is accounted for by the amount of lime in it, and to the fact that some 20 percent of the end product is positively identified as hydrated lime or calcium hydroxide. Are we not justified in believing that the same factors which control the qualities or properties of hydrated lime in the product described by Miller in this paper are not any different when the calcium oxide that is hydrated happens to be part of a particle of cement clinker?

END



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LESS DOWNTIME and MORE RECAPS!

Your quarry trucks will boost their production and beat downtime on Firestone SUPER ROCK GRIP DEEP TREAD tires. With 50% deeper treads of Firestone Rubber-X, they fight off cuts and bruises. This tough tread rubber goes all the way through to the cord, and offers a long-wear-

ing base for extra money-saving recaps! You get more built-in impact resistance with Firestone's new Shock-Fortified cord bodies of bonus-ply nylon. Get the downtime protection that's built into Firestone quarry tires—plus fast, on-the-job service—from your nearby Firestone Dealer or Store.

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TRUCK TALK

by Chet Cunningham



A single terminal nut—from a spark plug that accidentally dropped into the plug hole—caused this serious pitting on the piston face. Play it safe and keep all plug holes covered while working with spark plugs removed

It may seem elementary, but be sure to keep spark plug holes covered with a piece of cloth when you have the plugs out of any of your gas engine rigs. The damage that can result from some object dropping into the cylinder is amazing.

It causes heavy pitting on the piston face, and can nick and damage the cylinder sidewalls as well. This same hard object can ruin your spark plugs and valves too.

If something does get into a cylinder, try getting it out with a magnet. If this doesn't work, try this method: rock over the engine until both valves on the piston affected are closed. Then, take a small copper tube and bend it to form a straight hook. With the tubing attached to your air chuck, build up full pressure on your compressor; then insert the tubing into the spark plug hole and squirt the compressed air in every direction. The air pressure will probably blow the object right back out the plug hole.

You won't have to do this if you keep the plug holes covered.

Get more wear and better mileage out of your truck tires. B. F. Goodrich offers these suggestions—know more about your tires and how to take care of them. They offer these tips:

Overinflation and underinflation are two tire wear causes. Overinflation can seriously damage your tires. It does not compensate for overloading. It does not add strength to the tire. In fact, it actually weakens the cord body by reducing its ability to absorb road shocks.

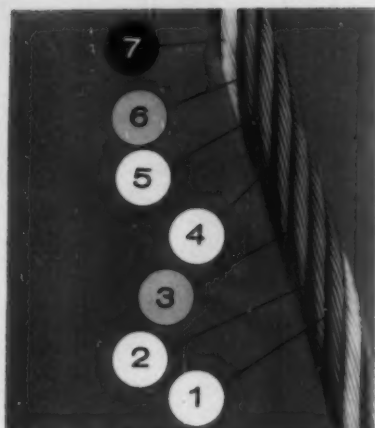
Overinflation leads to: rapid wear in the center portion of the tread; increased tendency toward bruises and impact breaks; excessive strain on beads and rim; abnormal tire growth, stretching of tread and tread cracking; abnormal stresses and strains in the tread that lead to separation; more cuts and snags; harder riding and reduced cushioning, leading to increased upkeep cost on equipment; reduced traction and skid resistance because less tread contacts the road.

Underinflation is bad too. Tires are designed to operate at certain recommended inflations which provide normal flexing with proper deflection and road contact. Underinflation leads to: tread wear on shoulders; irregular tread wear; excessive heat causing ply separation; increased tendency to bruise and tread separation.

For the best tire wear, inflate to recommended pressures when tires are cool. Check pressure regularly. Tighten valve caps, catch slow leaks. Lower tire pressure if your load is usually below maximum. Never bleed tires to relieve build-up. If excessive build-up does occur, either your load or speed or both must be reduced. Use the type and size tire that has the correct capacity for your load. Check your tires, save your checkbook!

If your mechanics have been busting knuckles trying to get corroded nuts off, take a tip from Texaco. They say to use a good rust-proofing compound on hard-to-turn nuts. Give them a shot during lubing. Then, when it's time to get the nut off, it's a simple job. Most oil companies have out a rust-proofing compound.

END



NEW 7-FLEX®

makes important savings
on most wire-rope applications



All-new Macwhyte 7-strand rope is flexible as 8-strand — rugged as 6 x 19 — fatigue-resistant like 6 x 37. You'll get longer rope life, lower costs. Get Bulletin 60100-R.

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WIRE ROPE MANUFACTURING SPECIALISTS SINCE 1896
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FOR DEPENDABILITY
PLUS ECONOMY
REPLACE WITH

INDIAN BRAND

Get the most out of your present equipment. When you need replacements, remember we started in 1913 to build our reputation in the Manganese Steel field for dependability plus economy.

Insist on
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Shovel Dippers • Dipper Teeth
Shovel Treads
Crusher Jaw Plates
Mantles • Concaves
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Pulverizer Hammers
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Ball Mill Liners • Screen Plates
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THE FROG, SWITCH AND
MANUFACTURING COMPANY
Carlisle, Pennsylvania • Established 1881

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NEW LITERATURE

For free information on these items, simply fill out
and mail postage-paid Reader Service Card
found elsewhere in this issue

Vibratory feeders

General Kinematics Corp. has released a bulletin on the company's line of vibratory feeders. The feeders are available in two types: adjustable rate, for remote, stepless control of feed rate and fixed rate, for constant rate applications.

Small eccentric counterweights mounted on the shaft of a 900-rpm. standard motor produce a rotating exciting force that is amplified through the resonance action of heavy-duty rubber shear springs to develop the forces required to vibrate the trough. Adjustable rate models utilize industrial-type air springs in addition to the rubber shear springs to vary the stroke and feed rate.

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Mesh screen pamphlet

Acme Iron Works has released a pamphlet describing the company's line of mesh screens. Included in the brochure are how the screens are made, different types, standard wire sizes, the company's standard wire screen sizes and ordering information. Diagrams and illustrations aid in describing the screens.

Enter 601 on Reader Card

Bin outlet

The Bin-Dicator Co. has issued a brochure that describes and illustrates the company's new bin outlet that provides uniform flow of most granular and lump materials. The unit is not an attachment to a conventional outlet. It

replaces the lower section of a conventional hopper and becomes an integral part of the bin. The design has been incorporated in a series of standard units in sizes adaptable to most standard bins, old or new.

Enter 602 on Reader Card

Automation system



Reliance Electric & Engr. Co.'s new bulletin explains how drive speeds of machines and processes can be automatically controlled and regulated by pneumatic instrumentation. Concise drawings and descriptions show how the company's system can be applied to control liquid level, line pressure, process temperature, constant flow, steam pressure and motor loading. Web processes such as dancer roll tension and center-wind tension may also be controlled by the unit. A number of pneumatic pressure control systems are possible, including various manual remote, automatic open loop, automatic closed loop and multi-unit systems.

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Please turn to page 150



GRINDING FOR LESS THAN 1¢ A YARD

The Featherlite Company of San Antonio, Texas, relies on an American #9 grinder for reduction of 130,000 cubic yards of expanded shale annually. J. B. Bell, plant manager, states, "The American #9 is best for this type of grinding. Maintenance is very low, in fact, our total grinding costs are less than 1¢ a cubic yard. This is amazing since our material has a 68% silica content and is extremely abrasive. We produce over one million lightweight blocks annually and sell the balance of the lightweight aggregate in the San Antonio area."

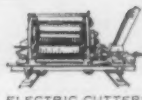
In addition to low maintenance, the grinder features wet or dry grinding, no screen plates required, suspended mullers are adjustable to volume and size requirements, gears are long-wearing cast material, only 25 horsepower required, volume up to 30 cubic yards per hour.



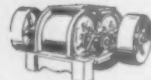
American

CLAY MACHINERY

Do Your Job The AMERICAN Way



ELECTRIC CUTTERS



SMOOTH ROLL CRUSHERS



DISINTEGRATORS



PUG MILLS



GRINDERS



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COMBINED MACHINES

DIVISION OF

HUBER-WARCO COMPANY - Marion, Ohio, U.S.A.

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HIGH SPEED CONVEYING OF BULK MATERIALS

SYNTRON

MECHANICAL

VIBRATING CONVEYORS



SAVE BULK MATERIALS HANDLING COSTS

Many industries through the nation are recording big monthly savings in operating and maintenance costs by using Syntron Mechanical Vibrating Conveyors.

Designed to handle most bulk materials efficiently at high ton per hour rates—sand, sinter, castings, hot or cold—constructed to withstand the wear and abuse of foundry operation, built for long dependable service with a minimum of maintenance.

Syntron has a full line of types and size for every job. Investigate the possibilities of Syntron Conveyors in your operation.



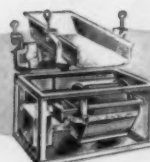
Vibrating Conveyors — handle fines, granules, or chunks — damp or dry, hot or cold — provide a constant, high speed flow of materials.

61VC1

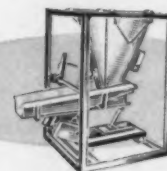


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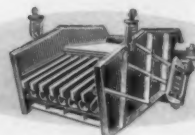
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There is a wealth of valuable information in the manufacturers' booklets offered in this issue. For your convenience, each advertisement, each new machinery and new literature item has been given a key number. Simply fill in the proper key number in the appropriate space on the card above and send it to us. We'll do the rest.



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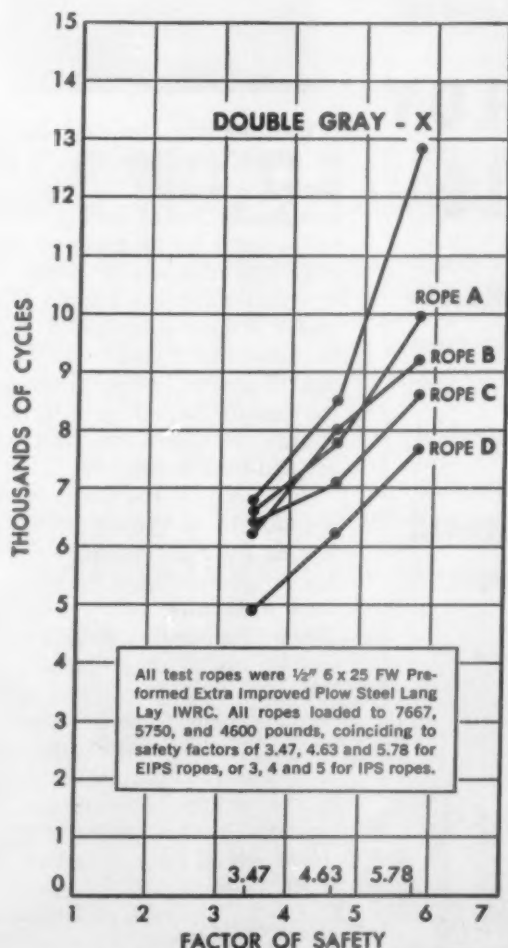


DOUBLE GRAY-X[®] lasts longer

Tests prove CF&I-Wickwire's premium wire rope has 45%* more bending life than average of other ropes tested

In an extended series of tests conducted at CF&I's Palmer Plant, five brands of wire rope were tested to destruction on a 25,000-pound fatigue machine that bends wire rope back and forth over sheaves until it breaks.

All the ropes tested were made by major manufacturers, and were identical in size and specification. And all exceeded the catalog-breaking strength of extra-improved plow steel rope. But, as the chart indicates, one rope outlasted all the others at every safety factor used in the test. That rope was Double Gray-X!



At the highest and most commonly-used safety factor, CF&I-Wickwire's premium wire rope lasted 30% longer than the rope that survived next longest, and 68% longer than the rope that lasted the shortest length of time. Double Gray-X lasted 45% longer than the average of all other ropes tested at this safety factor.

Double Gray-X has greater resistance to bending fatigue, the chief enemy of wire rope life, because it is the result of a breakthrough in wire-drawing technology. The use of molybdenum disulphide in the drawing process produces these outstanding fatigue-resistance factors:

- A Molecular Shield . . . which prevents the wires from grinding together as the rope operates.
- Smoother Wire Surfaces . . . providing better resistance to fatigue.
- Extra Toughness . . . because molybdenum disulphide helps preserve the inherent toughness of the wire during drawing.

Double Gray-X can save you money because it lasts longer on even the most punishing jobs, as proved by these tests and by field reports from satisfied users. This longer-lasting wire rope cuts repair and replacement costs, lowers your total wire rope investment and reduces machine downtime. Use the wire rope of *tomorrow* today! Ask your CF&I salesman for complete details.

*Percentage above average of all other wire ropes tested at safety factor of 5.78.



The Colorado Fuel and Iron Corporation

Denver • Oakland • New York
Sales Offices in All Key Cities

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New Literature

continued from page 144

Kiln scanning pyrometer

Leeds & Northrup Co. describes its radiation detector, a pivoting pyrometer system that detects impending hot spots on the shell of a rotary kiln or other high-temperature vessel, in a 4-page data sheet. The publication describes the advantages of automatic hot-spot detection,

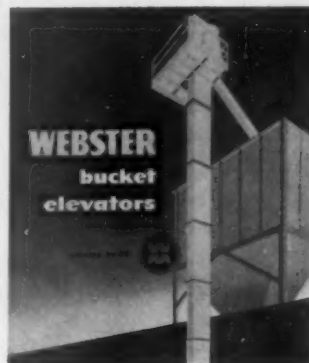
and explains how this system is applied for continuous and reliable monitoring of kiln-shell temperatures.

Featured is a complete description of the pivoting-detector unit which can be mounted with only two bolts to any nearby surface, beneath, beside or above the kiln, and which does not require spe-

cially built traversing mechanism or structural support. The sheet includes photographs and diagrams illustrating all details of the equipment and its installation. A listing of specifications and ordering instructions completes the data.

Enter 604 on Reader Card

Bucket elevator manual



Webster Mfg., Inc., has issued an 84-page manual that is designed to simplify the selection and application of bucket elevator systems for all types of minerals and abrasive or non-abrasive materials. The booklet illustrates a wide selection of basic bucket-elevator types... centrifugal discharge, perfect discharge, continuous bucket, gravity discharge elevator-conveyors and pivoted-bucket carriers.

A spread on the basic fundamentals to be considered in selecting the right bucket elevator for a given handling problem lists 8 factors which must be taken into account. Practical examples are given to explain the use of this information in selecting specific bucket elevator types. A table lists 101 different bulk materials regularly handled in the various industries and 318 possible bucket elevator types from which one can select the right types.

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Please turn to page 153

Job tested

for Economy-Efficiency!

**Get the Long-Lasting
Forged, Heat treated**

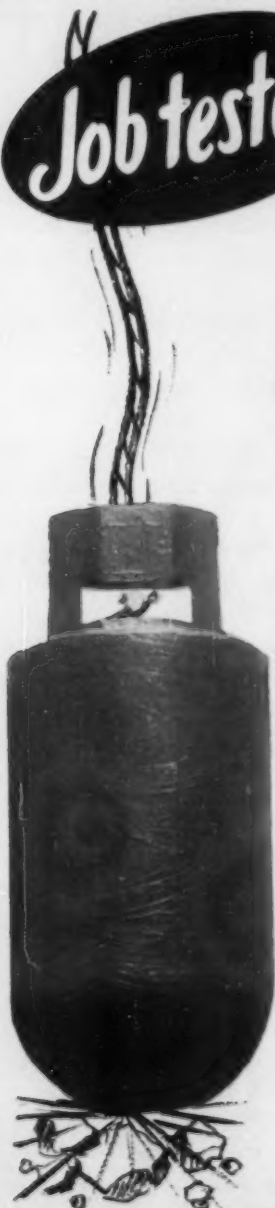
CAPE ANALLOY DROP BALL

FORGED and HEAT TREATED from abrasive resisting **ALLOY STEEL**. Specifically designed for rugged service. Economical, dependable secondary breakage! **SONIC TESTED** before shipment.

Furnished in sizes from
2000 to 12000 lbs.

**CAPE ANN
ANCHOR & FORGE CO.**

P. O. BOX 361
GLOUCESTER, MASS.



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Two ML-157 Moto-Loaders work in the Giordano Brothers gravel pit in Whitevale, Ontario, Canada.

ONE MOTO-LOADER FOLLOWS ANOTHER

These two ML-157 Moto-Loaders, equipped with 2-yd. buckets, work 12 hours a day loading bank run gravel into trucks to haul to the gravel plant and then loading out gravel from stockpiles. They have been doing this for two years—ever since the first one proved its performance in this pit on a demonstration. It did such a good job compared to competitive machines, they just wouldn't let it go. The second one was added shortly after.

A demonstration will convince you too, of how much more an ML-157 can do—how its job-tested features can put more profit in your pocket with its power, stam-

ina, balance and fast, easy control. The bucket fills easily, fully. Planetary wheel drive keeps torque near the ground where it belongs. Low center of gravity and proper weight distribution eliminate teeter and bounce. Power-shift transmission, plus one-foot control of forward, reverse and acceleration, give cycle times that up production.

There are many more reasons why the Lorain ML-157 merits your investigation. Why not let your nearby Lorain distributor tell you the full story. Call him today.

THE THEW SHOVEL COMPANY, LORAIN, OHIO

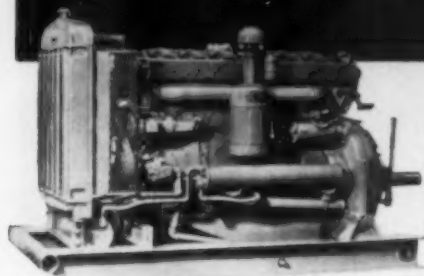
LORAIN[®]
DOES MORE
FASTER • FOR LESS

PLANTS in Lorain and Elyria, Ohio.

PRODUCTS—Power shovels, cranes, draglines, clamshells, and hoes on crawlers from $\frac{3}{8}$ - to $2\frac{1}{2}$ -yard capacity • Cranes from 7 to 80 tons . . . on crawlers, and as rubber tire Moto-Cranes, and Self-Propelled Cranes • Rubber tire front-end Moto-Loaders in 6,000-lb., 7,000-lb., and 9,000-lb. operating capacities.

OUTLETS—Lorain products sold and serviced by 249 distributor outlets throughout the world.

Another way
you save money
with a
MURPHY DIESEL



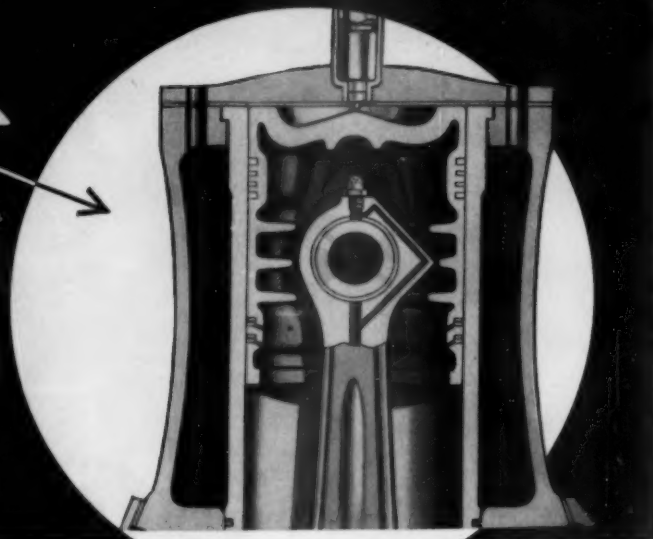
MORE MONEY-SAVING FEATURES

Unit Fuel Injectors serve as both pump and nozzle to provide precise control, faster response and greater fuel economy with minimum downtime, minimum attention.

Hydraulic Servo-Type Governor assures immediate response to load change and protects engine from damage if lube oil pressure drops below a safe level.

Four Valves Per Cylinder have greater breathing capacity for cooler running, and permit higher power output.

Murphy Diesel engines and power units, 105 to 420 HP; generator sets, 70 to 227 KW; dual fuel engines, 147 to 242 HP; marine engines and auxiliaries, 105 to 420 HP.



"TRUE" DIESEL OPERATION ASSURES

**greater fuel economy
uninterrupted service
faster starting
smoother performance**

If you want to get more power from every drop of fuel, smooth-running performance, and long service life, be sure you get a "true" diesel.

Murphy Diesel is a "true" diesel. The cross section above shows the combustion chamber. Note that it is plain and open. There is no pre-mixing chamber, no artificial device to create turbulence and affect combustion. In a Murphy, the unit fuel injector, located in the center of the combustion chamber, sprays completely atomized fuel directly into all parts of the air charge. Since all the fuel burns immediately upon injection into the incandescent air charge, combustion is controlled solely by the unit injector, which in turn is precisely controlled by the hydraulic servo-type governor.

Ask your Murphy Diesel Dealer for proof of Murphy's ability to save you money.

MURPHY DIESEL ENGINE FEATURES MEAN MORE PROFITABLE OPERATION



MURPHY DIESEL COMPANY

5315 W. Burnham St.,

Milwaukee, Wisconsin

SALES... PARTS... SERVICE

Throughout the Nation

427-RO

Enter 1291 on Reader Card

New Literature

continued from page 150

WEMCO reprint

WEMCO Div., Western Machinery Co., has issued a reprint booklet entitled "The Application of Heavy Media Separation to Beneficiation of Concrete Aggregate" by I. S. Thyle and C. E. Golson. Descriptive diagrams, charts and illustrations are included with the text.

Enter 606 on Reader Card

Processing equipment

Edw. Renneburg & Sons Co. is offering a 16-page bulletin that illustrates and describes dryers, calciners, kilns, coolers, coaters, spheroidizers, flash drying equipment, refractoryless furnaces, combustion equipment, air handling systems, air pollution control systems, cookers, digestors, granulators, mixers, pug mills, presses, extractors, counter-current washers, pilot plant units, reactors, roasters, distillation towers, and other specialized machinery. Included are more than 75 photographs, as well as numerous drawings and diagrams.

Enter 607 on Reader Card

Unique hauling problems



Athey Products Corp. has offered a 12-page booklet that provides practical answers to unique hauling problems, particularly for jobs that cannot be handled by conventional-wheeled vehicles. The booklet tells how high-flota-

tion track-type trailers provide hauling capabilities in many functions. It shows how these machines can operate wherever track-type tractors can work. The booklet illustrates the engineering principles of the units and shows the reasons why and how they ease hauling operations. A number of specific on-

the-job applications are pictured along with full explanations of the many problems they have solved. The booklet also includes a section on specifications, including complete specifics on weight and dimensions. A design chart provides facts on hauling capacities.

Enter 608 on Reader Card

Please turn to page 154

Tailor-made to give you more efficient blasting! BEMIS EXPLOSIVES BAGS

Bemis Explosives Bags for ammonium nitrate and nitro-carbo-nitrate are tailor-made to your requirements—to give you more efficient blasting.

More economical: Use of Bemis Explosives Bags and ammonium nitrate mixtures can save up to 50 percent on explosives costs.

Easy to fill: Bemis provides technical assistance, manufactures equipment to speed up bag filling.

Wet hole or dry hole . . . you'll get top efficiency at minimum cost with . . .

Bemis Burlap Bags with heavy-duty polyethylene liners. The rugged burlap absorbs the punishment of handling or jagged holes. Poly liner provides waterproofness.

Other Bemis Explosives Bags:

Flexibly® Bag with poly liner. Here three plies of rugged creped wet-strength kraft provide the toughness.

Laminated Bags. Constructions of burlap, kraft paper, polyethylene and pliofilm—in varied combinations—are all performing satisfactorily in the pits and on construction sites.



Write today for sample bags and additional information on Bemis Explosives Bags.

Bemis

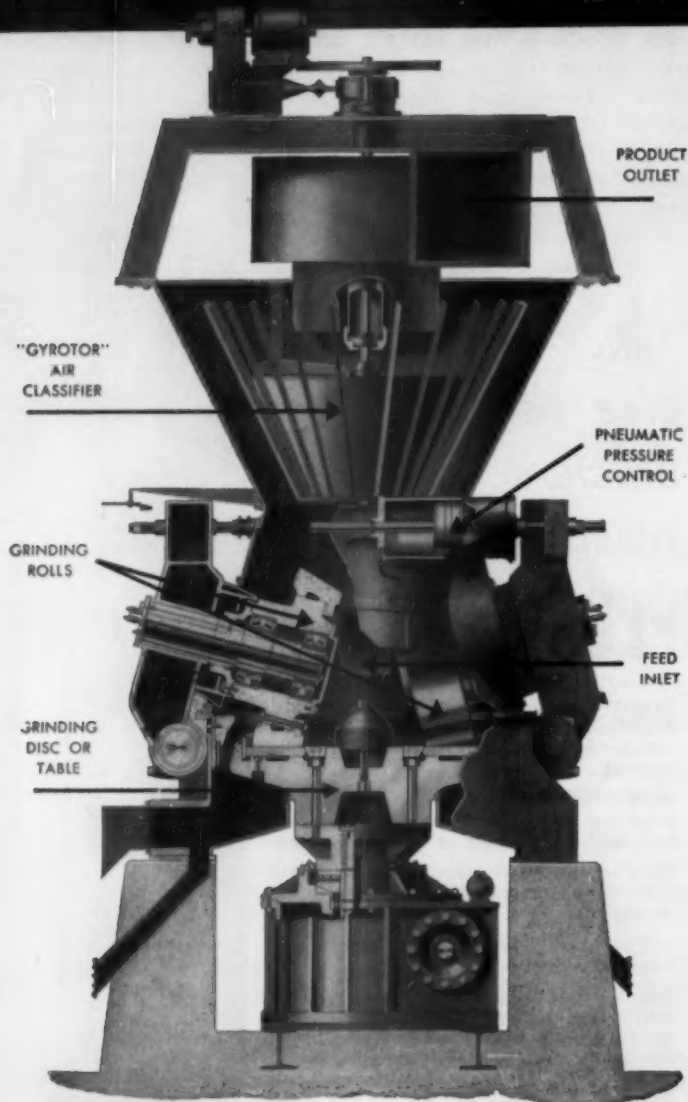
Where packaging ideas are born

General Offices—408-M Pine Street, St. Louis 2



Enter 1261 on Reader Card

DISC-ROLL MILL



The Hardinge Disc-Roll Mill is applied to dry grinding of minerals such as talc, limestone, coal, phosphate rock, bauxite, clays, celestite, and gypsum. The Disc-Roll Mill incorporates either spring or pneumatic roll-loading. With pneumatic loading, the pressure on the rolls can be released or increased at will. Complete flexibility of operation results. The problem of over-loading is eliminated. Also, the Hardinge Gyrotor® Classifier is standard equipment on the Disc-Roll Mill. This classifier provides very close control of the finished product over a wide range of sizes. Ask for Bulletin 52-7.

HARDINGE
COMPANY, INCORPORATED

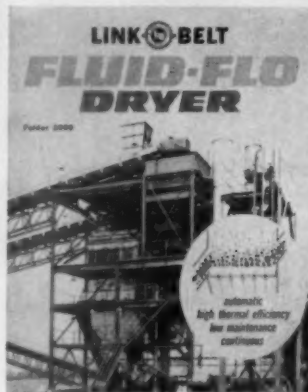
Main Office and Works • 240 Arch St., York, Pa.

"Hardinge Equipment—Built Better to Last Longer."

NEW YORK
TORONTO
CHICAGO
HIBBING
SALT LAKE CITY
SAN FRANCISCO
HOUSTON
LAKELAND
BIRMINGHAM

Enter 1262 on Reader Card

New Literature continued from page 153



Dryers

Link-Belt Co. describes the company's line of dryers and how they work in a 6-page folder. The folder illustrates how the unit can be applied in drying, cooling, roasting and other processes, with minimum product loss or degradation. A full-page drawing of the dryer in an engineered installation shows how granular solids are processed through the system. Laboratory photos illustrate "fluidized" granular solids and the degree of turbulence in incipient, dense and dilute fluidization. Three line drawings also illustrate the scope of applications for this new unit.

The folder is being distributed with a separate insert, "Dryer and Cooler Data Sheet." This sheet lists considerations of material characteristics and individual operating requirements for specific installations.

Enter 609 on Reader Card

4-wheel drive loader

The Thew Shovel Co. has released a bulletin on its 9,000-lb. capacity, 4-wheel drive loader. Included with diagrams and illustrations are discussions of tilt cylinders, buckets, hoist cylinders, engines, weight distribution, 4-speed power-shift transmission, chassis frame, axles, "safety" arms and specifications.

Enter 610 on Reader Card

Pneumatic integrator

B-I-F Industries, Inc., has recently issued a new bulletin that describes the company's pneumatic integrator. This unit multiplies belt travel with belt loading to produce direct read-out of the true weight being conveyed over the weighing section. It features explosion-proof construction, high sensitivity, direct reading totalization, and simple adjustments for zero settings. The bulletin includes an illustration of the integrator, together with dimensional drawings, accessory listing and other descriptive material.

Enter 611 on Reader Card

Detonating fuse catalog

The Ensign-Bickford Co. is offering a 72-page catalog and manual, pocket size, which illustrates and describes detonating fuses. A section covers the company's six standard brands of detonating fuse for commercial blasting. The manual illustrates and describes approved operations in priming, loading and hooking up the fuse for instantaneous and delayed firing. The text covers use of detonating fuse in mining, stripping, quarrying, pipeline and construction work.

Enter 612 on Reader Card

Mechanical air separators

The Raymond Div., Combustion Engr., Inc., announces the production of a 16-page, two-color bulletin on mechanical air separators. The bulletin combines the illustrated and completely described features of single and double mechanical air separators with detailed diagrams of the equipment available, pertinent technical data covering the various types of materials to be processed and listing of tables of specifications.

Enter 613 on Reader Card
END

HERE'S THE ALL-NEW ALL-HYDRAULIC crawler-mounted C-350 REICH drill

NOMINAL HOLE SIZE — 2-4"
DOWN-PRESSURE — 10,000 lbs.
ROTARY SPEED — 0-200 rpm.

Versatile — prospects with diamond core bits or wire line tools . . . drills blastholes with 3-cone rotary bits or In-Hole Drills.

Maneuverable — can climb a 25% grade, turn in its own length . . . tram at almost 8 mph!

Stable — 14" wide tracks . . . exceptionally low center of gravity . . . 8' 8" wide frame, meet and beat any terrain.

Operator convenience — Control Console places every control at operator's fingertips . . . every movement within sight . . . and hydraulics do all the work — give infinite combinations of feed pressure and rotational speeds.



REICH drill

FRANKLIN (VENANGO COUNTY), PENNA.

Division: CHICAGO PNEUMATIC TOOL CO.



Enter 1263 on Reader Card

NEW MACHINERY

For free information on these ideas, simply fill out and mail postage-paid Reader Service Card found elsewhere in this issue



Stainless steel covered gondola

The gondola car of the future is now available to rock products producers who make bulk shipments by rail. Portland cement, lime, industrial silica and a host of other non-metallic minerals can be delivered in these kitchen-clean, stainless steel gondolas.

While the interior parts in contact with the lading are fabricated of stainless steel, low-alloy, high-strength steels provide exceptional structural strength and light weight for this economical, versatile gondola.

The new car has been carefully designed to protect the contents from contamination. All-welded, stainless steel hoppers have no crevices where materials can build up to mix with later shipments of different materials. Stainless steel overcomes the chance of corrosion or abrasion, yet the car is 16 percent lighter than conventional covered-top gondolas made from ordinary structural steel. (United States Steel Corp., 525 William Penn Pl., Pittsburgh 30, Pa.)

Enter 200 on Reader Card

Dust level control

A newly developed dust level control is reported to operate with exceptional dependability. It has no moving parts in contact with the solids it is sensing. This feature eliminates the hazards of wear and temperature.

The control operates under three basic conditions—negative pressure in the bin or hopper, positive pressure and atmospheric pressure. Two sensing bells are needed for the first two conditions; only one for atmospheric conditions. A pressure switch, diaphragm and light mounted in a dust-tight case completes the assembly.

Rock products producers will find a number of opportunities to sense and control the level of materials in bins or hoppers handling sand, agricultural limestone, pulverized lime, stucco and portland cement. The advantages of pressure operation can be realized in improving the control of dust collecting and pneumatic conveying systems handling these fine materials. (Aerotec Industries Inc., Greenwich, Conn.)

Enter 201 on Reader Card

Correction

Kennedy Van Saun's automatic reduction crusher was incorrectly designated in a typographical error on p. 162 of the April issue. The name of this new crusher is Kone-O-Matic.

Enter 202 on Reader Card

Pug mill slaker

A homogenous mixture of completely slaked lime is said to be produced by a new pug mill slaker. The Model 42-03 Omega slaker will yield a lime slurry of the desired consistency at rates up to 4,000 lb. per hr.

Completely slaked lime is assured by positive control of the water-to-lime ratio, and this control is effective over the extremely broad range through which the slaker may be operated. The ratio may be varied between $1\frac{1}{2}$ to 1 and 4 to 1; it can be adjusted at any time during operation to produce the desired paste consistency.

The feed rates are controlled by electric and hydraulic controls on a console mounting. Water is regulated with a solenoid valve and timing device. Lime is fed into the unit with an Omega Gravimetric or Volumetric feeder mounted integrally. (B.I.F. Industries, Providence, R.I.)

Enter 203 on Reader Card
Please turn to page 158

END THE WORRY OF COSTLY ACCIDENTS!



Replace old-style loaders NOW with *Safety-Engineered* CASE rigs!

If you own any 4-wheel-drive loader that is *more than 3 years old*, or even some of later design, you can reduce the risk of serious accidents — and gain increased output as well — by trading now for modern *safety-engineered* loaders built by J. I. Case. You see, Case pioneered the "safety concept" in 4-wheel-drive loaders, by introducing a line of machines with *greatly improved balance and stability* — *plus forward-pivoted lift-arms* — that positively eliminate the major causes of accidents experienced with earlier competitive models. As a result, safety-minded owners everywhere are switching to Case, for extra "peace of mind" — and also for those *extra yards of output* that result when an operator can concentrate on his *work*, instead of his *machine*.

Four sizes to choose from — safety-engineered Case loaders are now available in three, job-proved, 4-wheel-drive models:

- **5500-lb capacity W-9** with 1½ to 2¾-cu yd buckets;
- **6500-lb capacity W-10** with 2 to 2⅞-yd buckets;
- **9000-lb capacity W-12** with 2½ to 3½-yd buckets.

You also get similar advantages with the thrifty, two-wheel-drive

- **3000-lb capacity W-5** with 1 to 1½-yd buckets.

Ask your Case Industrial Dealer for full information on Case operating advantages and finance-lease plans. Or write directly to Dept. F1471, J. I. Case Co., Racine, Wis., for free literature.

CASE

J. I. CASE CO., RACINE, WIS.



COMPARE YOUR MARGIN OF SAFETY!

CASE LOADERS

NO "SHEARING-ACTION" TO ENDANGER OPERATOR



Case lift-arms pivot up front, out of the way. No chance of "catching" operator's head or arms.

OLD-STYLE LOADERS

CONSTANT BANGER OF HEAD-ARM INJURIES



Rapid scissor-action of lift-arms — on both sides of operator — creates constant and distracting hazard.

PERFECT VISIBILITY



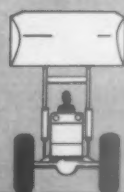
Operator can see in all directions, at all times. There are no dangerous "blind spots" to block vision.

POOR VISIBILITY



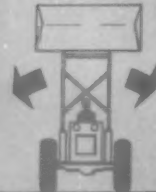
Operator is "blind" on both sides, when lift-arms are raised ... can't see other vehicles or workers.

NO TIP, NO SWAY!



Perfect machine balance permits fast cycles on any terrain, with less danger of over-turning.

UNSTABLE UNDER LOAD



Improper balance can cause rig to nose-dive or tip sideways — especially on soft ground, bad grades.

FREE, EASY EXIT



Operator can open cab doors and "bail out" in a hurry — even with lift-arms fully raised.

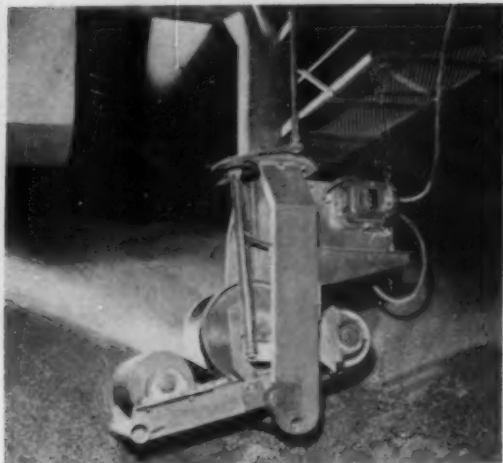
OBSTRUCTED EXIT



Operator is "trapped" ... can't open cab doors, or leave machine, when lift-arms are raised.

New Machinery

continued from page 156



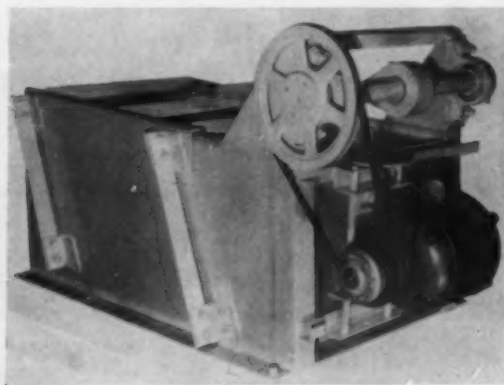
Stockpiling slinger

Sand, clinker and other fine, granular materials can be put into bigger and deeper stockpiles with a newly developed slinger. Or the new machines can be used to fill every corner of storage buildings, box cars or bins and, thus, take advantage of otherwise inaccessible space.

Two Speed Loaders are available—12 and 18 in. wide—in five types. Both models have a high-speed belt conveyor suspended from a remote-controlled swiveling chute. Material trajectory may be varied between 8 and 40 deg. to give a discharge radius up to 50 ft. for sand. Direction and trajectory may be controlled while the unit is in operation. (Ft. Worth Steel & Mchry. Co., Fort Worth 1, Texas)

Enter 204 on Reader Card

Vibrating feeders



A new line of welded steel vibrating feeders is said to offer a genuine advance in dependability and continuous production when handling granular materials. These new feeders are equipped with

volumetric controls to change from maximum to minimum rates within seconds. Leaf-spring suspension assures continuous feeding with low power consumption and quiet operation.

Two models are available to handle between 20 to 200 tph. of material—hopper type and flange type. The flange type is ideal where headroom is limited, while the hopper style provides an excellent ground-level installation where it serves as the bottom of large bins. (Ridge Equipment Co., Fallentimber, Pa.)

Enter 205 on Reader Card

Takeup frames for pillow blocks

A new line of all-steel takeup frames has been designed to accommodate any 2-bolt base pillow block. This offers the rock products producer an opportunity to eliminate his maintenance inventory of special takeup bearings.

The steel frames are fabricated as a box frame to give high rigidity in small space. Steel channels protect the galvanized takeup screw. Mounting feet have three holes to simplify mounting on structural steel supports.

Eleven sizes are available from stock to mount 143 different pillow blocks ranging from $\frac{5}{8}$ to $2\frac{7}{8}$ -in. shaft diam. Takeup adjustments range from 6 to 25 in. Mounting pads on each takeup are readily adjusted to the bolt holes on each pillow block, and each unit is complete with galvanized nuts, bolts and washers. (Link-Belt Co., Prudential Plaza, Chicago 1, Ill.)

Enter 206 on Reader Card

Look for the rubber lining

A new industrial rubber lining has been developed that can be cold-bonded to sheet steel. It will protect chutes, hoppers and bin bottoms from abrasion and corrosion when handling many of the wet, abrasive products in the rock products industry.

This natural rubber lining may be applied to a wide number of other metals, fabrics and other rubber compounds. It is suitable for patching or recapping worn or torn conveyor belts. Field application for any purpose calls only for a clean, oil-free, dust-free surface. The adhesive used cures to a tough permanent bond that exceeds most other cements.

The new lining material is available in sheets up to 4 ft. wide and in a range of thicknesses from $\frac{1}{4}$ up to $\frac{1}{2}$ in. (The Goodyear Tire & Rubber Co., Akron 16, Ohio)

Enter 207 on Reader Card

Please turn to page 160

IT'S THE BIGGEST!



THE NEW LE ROI 1200 ROTARY

— world's largest portable rotary air compressor

— with cost-saving twin-unit design

Here's the giant-economy-size portable air compressor that can't be beat for capacity, flexibility, compactness — and certainly not for low-cost air power or money-saving design and performance!

The new Le Roi rotary is a portable cyclone — delivers a full 1200 cfm of air at 100 psi — plenty of power for the big demands of pile driving, large-hole quarry drilling, tunnel jobs, multiple pipe line rigs, shaft jumbos, or as a stand-by source of plant air. One 1200 replaces a dozen small portables — eliminates

site clutter and the need for extra men and trucks for hauling — minimizes between-job delays and slashes fuel consumption and maintenance.

Twin compressors operate at 1800 rpm, engines at 2000 rpm. Unit weighs 14,700 lbs. dry, has an 18 ft. turning radius, and meets all existing state highway regulations.

Twin-unit design gives you two individually-controlled compressors that can be operated separately for 600 cfm or together for 1200 cfm output. It permits one unit to be shut

off when air demand falls below 600 cfm, or for servicing, without interrupting work. Compressors can be alternated to reduce wear — interchangeable engine and compressor parts provide added protection against costly emergency shutdowns in the field.

Get the complete design-performance story from your Le Roi distributor. He'll be glad to send you literature — and even happier to put the new 1200 rotary through its paces for you.

FC-333



LE ROI

Division of Westinghouse Air Brake Co., Sidney, Ohio, manufacturers of
Newmatic air tools, portable and Tractair® air compressors, stationary
air compressors. Write us for information on any of these products.



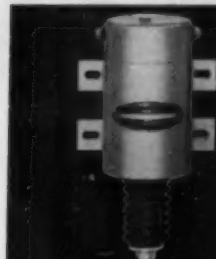
HEAVY DUTY D. C. SOLENOIDS

MODEL SL

VOLTAGES (D.C. Only)
6V. 12V. 24V. 32V.
CURRENT DRAW.... (Pulling)
55A. 35A. 15A. 12A.
CURRENT DRAW.... (Holding)
1.6A. .8A. .4A. .3A.
DUTY Continuous
CYCLES..... Not to exceed
6 per minute
PULL... Approximately 10 lbs.
over 1/2 inch stroke
WEIGHT..... 2 1/2 pounds



Model SL



Model SD

MODEL SD

VOLTAGES (D.C. Only)
12V. 24V. 32V. 115V.
CURRENT DRAW.... (Pulling)
40A. 20A. 15A. 4A.
CURRENT DRAW.... (Holding)
.5A. .25A. .20A. .05A.
DUTY Continuous
CYCLES..... Not to exceed
6 per minute
PULL... Approximately 10 lbs.
over 1 1/2 inch stroke
WEIGHT..... 4 1/4 pounds
Model SM available with 1 inch stroke.

SYNCHRO-START PRODUCTS, INC.
8151 N. RIDGEWAY AVENUE • SKOKIE, ILL.

Enter 1265 on Reader Card

Slurries...handled at lower cost

The new WILFLEY MODEL K Centrifugal Sand Pump embodies important mechanical improvements especially adapted to the handling of cement slurry and results in stepped-up production and substantial power savings. Individual engineering. Write for details.

**A.R. WILFLEY
and SONS, Inc.**
Denver, Colo., U.S.A.



Buy WILFLEY
for Cost-Saving
Performance

WILFLEY
centrifugal PUMPS

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T.C.
WRITE FOR
CATALOG
56

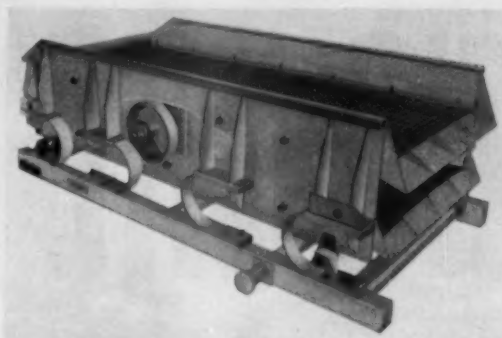
**DURABLE
ECONOMICAL
WOVENWIRE
SCREEN
KNOWN AROUND
THE WORLD**

TWIN CITY IRON & WIRE CO.
35 W. WATER STREET • ST. PAUL 7, MINNESOTA

Enter 1267 on Reader Card

New Machinery

continued from page 158



Bigger vibrating screens

This manufacturer has extended his line of vibrating screens to include single and double-deck units in the 6 x 14 ft. sizes and to 5 x 14 ft. in the three-deck units. These screens are high-speed, lightweight units that require a minimum of horsepower for large capacity. All screens in the line are particularly effective for fine screening. (Kolman Mfg. Co., Sioux Falls, S.D.)

Enter 208 on Reader Card

Hyperbolic bin bottom

Vibrators and other attachments to keep damp, sticky materials moving through bin bottoms can be dispensed with. This is the claim for a newly patented outlet for bins. The new device is said to provide full and uniform flow of lumpy and granular materials through bins.

The new hyperbolic outlet is not an attachment; it replaces the lower section of a conventional hopper and becomes an integral part of the bin itself. Sizes range from 12 x 12-in. to 24 x 24-in. sq. outlets to fit six slopes between 45 to 70 deg. (The Bin-Dicator Co., 13946 Kercheval Ave., Detroit 15, Mich.)

Enter 209 on Reader Card

Variable-speed pulleys

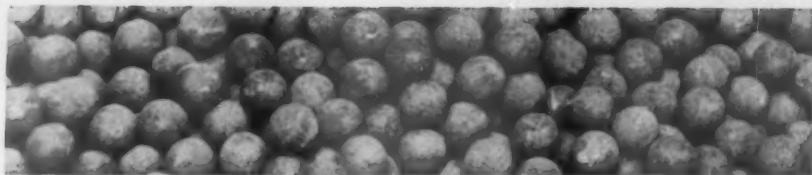
Instantly variable-speed control for V-belt drives is assured with a new series of pulleys. These are rated from 1 to 5 hp. at 1,750 rpm. and provide a speed range up to 3 to 1 ratio.

Each pulley face is independently actuated by its own spring and cam assembly. This assures constant speed at all times and prevents pulley spread even under overload conditions.

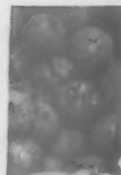
Standard bore sizes are available from 5/8 to 1 1/8 in. and with a range of bore lengths and pitch diameters. (Lovejoy Flexible Coupling Co., 4949 W. Lake St., Chicago 44, Ill.)

Enter 210 on Reader Card

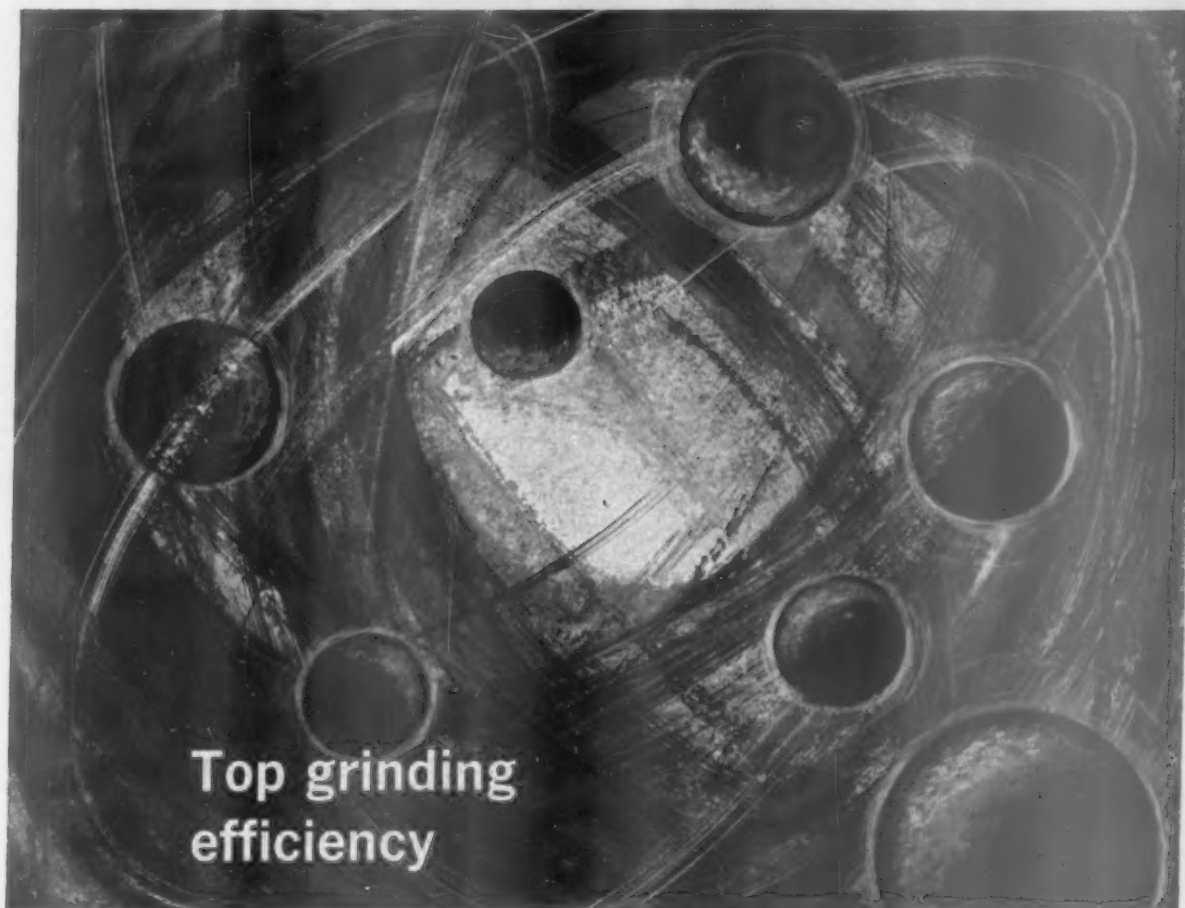
Please turn to page 162



Strong
Tough
Economical
Efficient
Lasting



SHEFFIELD **MOLY-COP** Grinding Balls



**Top grinding
efficiency**

**has earned customer
acceptance**

Around the world, over a million tons of Sheffield Grinding Balls have given customers the top efficiency that comes from consistently uniform hardness, toughness and fine, dense grain structure right to the core. This uniform grinding efficiency (which also means uniform economy) is the result of Sheffield's constant quality control in alloying, forging and heat-treating — from furnace to finished ball. **Sheffield Plants: Houston, Kansas City, Tulsa.**



Sheffield Division

New Machinery

continued from page 160



Bag closure tape

Multi-wall bags are now available with zip-top closures. Bemistrip is the name of the new, unique, quick-opening device for sewn open-mouth and sewn valve paper bags. Protection of the bag seam is said to be equal to present methods of closing sewn bags.

The new tab is as simple to open as the band on a pack of cigarettes. A gentle pull snaps a tab loose from the bag seam, and the bag can be partially or completely opened with little effort. (Bemis Bro. Bag Co., 408 Pine St., St. Louis 2, Missouri)

Enter 211 on Reader Card

Versatile welding rod

Hard-to-weld steels and dissimilar metals can now be welded with Hardalloy 120. Rock products producers will find the new rod of great use to hardface or weld dipper teeth, crusher hammers, sprockets, crusher rolls and jaw parts. In addition, the new rod can be used with austenitic manganese steel, stainless steels and a wide range of carbon and alloy steels.

The new rod provides crack resistance equal to armor welding electrodes. Its build-up material has high compressive strength, good corrosion resistance, hot-hardness up to 1,000 deg. F. and work-hardening under impact.

Hardalloy manual electrodes are offered in $\frac{1}{8}$, $\frac{3}{32}$, $\frac{1}{16}$ and $\frac{1}{4}$ -in. sizes in standard 14-ft. lengths. Each pound covers about 24 sq. in. to a depth of about $\frac{1}{8}$ in. (The McKay Co., 1005 Liberty Ave., Pittsburgh 22, Pa.)

Enter 212 on Reader Card

Enclosed gear drive for washer

The efficiency of double-screw washers can be greatly improved with a newly developed enclosed gear drive. This achieves the advantage of a single big motor and V-belt drive, eliminating the second motor with its starter, wiring and drive. The totally enclosed housing maintains the gears in perfect alignment with each other. The enclosed gears have been selected to assure the correct rotation speed of each shaft and the maximum efficiency of the machine. A single gasoline or diesel engine may be substituted for an electric motor. This new enclosed gear drive will be standard equipment on all of the maker's 36, 44 and 54-in. fine material washers and on all its 30 and 36-in. coarse material washers. (Eagle Iron Works, 137 Holcomb Ave., Des Moines, Iowa)

Enter 213 on Reader Card

Seismic testing machine

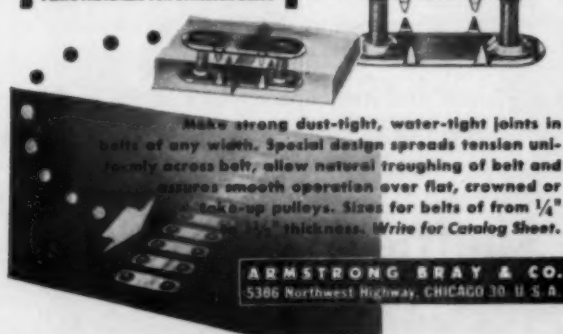
Highly efficient rock ledge exploration is possible with a new, light-weight seismic blasting machine. The battery-operated, capacitor-discharge unit is good for thousands of shots without battery replacement.

Bed rock can be detected at depths exceeding 100 ft. using two or more seismic blasting caps. The 4 x 7-in. unit has a built-in circuit tester, ready light and three-switch safety feature. (Dyna Metric Inc., 2955 E. Colorado Blvd., Pasadena, California)

Enter 214 on Reader Card
Please turn to page 164

PLATEGRIP

PLATE FASTENERS FOR CONVEYOR BELTS



ARMSTRONG BRAY & CO.
5386 Northwest Highway, CHICAGO 30, U.S.A.

Enter 1268 on Reader Card

WHAT ARE YOU PAYING FOR REPAIRS?

The money you are paying to keep worn-out equipment working may be just enough for you to own better equipment.

See the "WHERE TO BUY" Section

C-E RAYMOND SYSTEMS OF



**FOR THE UNIFORM PRODUCTION OF
FINE, DRY, POWDERED MATERIALS BY
AN AUTOMATIC, DUST-FREE OPERATION.**

RAYMOND Flash Drying is available with different types of equipment, shown above, for handling a wide range of operations and materials.

It is a clean dust-free automatic system for removing moisture from fine particles by a high-velocity heated airstream. It delivers a fine, dry, uniform product of specified fineness and dryness.

It offers new economies in the manufacture of fine chemicals, pigments, synthetic resins, hydrated compounds, filter cakes, food products, gypsum and clays.

Combines in one integrated system the functions often performed by several different units.

Uses minimum building space for a given capacity. Provides accurate control of final moisture content in the finished material.

Minimum attention and operating labor with continuous automatic operation.

Instantaneous moisture removal (6 to 10 seconds) assuring a high quality product.

Safe operation with only a small quantity of material in the system at any time.

**FOR FURTHER INFORMATION ON THESE MACHINES
WRITE FOR RAYMOND CATALOG NUMBER 82 R.**

COMBUSTION ENGINEERING, INC.

Combustion Engineering-
Superheater Ltd.
Montreal, Quebec, Canada

Raymond Division

427 WEST RANDOLPH STREET • CHICAGO 6, ILLINOIS

Sales Offices
in all
Principal Cities

Enter 1288 on Reader Card

New Machinery

continued from page 162

Hot gas fans

A new line of fans is available in two models to handle hot gases from dryers, mills and kilns. One model of the new FF fans has been specially designed to operate with hot air or gas up to 300 deg. F.; the other, up to 2,000 deg. F.

Both fans are available in a wide range of diameters, from 7½ to 73 in., and with either overhung or direct drives. Of course, gas-tight, corrosion-resistant or abrasion-resistant blades and housings are readily available for the many unusual applications in lime, gypsum or portland cement plants. (Garden City Fan & Blower Co., 801 N. 8th St., Niles, Mich.)

Enter 215 on Reader Card

Conductor cable replacement

The Dura-Flex bus bar is a new development that replaces conductor cables on heated vibrating screens. In contrast to cables, the new bus bar is installed to respond to vibrator motion. As a result, there is no snap or backlash to wear out the bars from metal fatigue.

Flexible bus bars may now be installed on any screen deck without heavy outriggers that extend

beyond the screen frame. The bars add no dead weight to the screen and have no effect on the balanced vibrator assembly. At the same time, the bars provide the necessary large cross-section to conduct low voltage current efficiently. (Screen Heating Transformers Inc., 428 Erie St. S., Mason, Ohio)

Enter 216 on Reader Card

Crawler-mounted drill

A new crawler-mounted drill incorporates a number of labor-saving devices including remote controls, and a flexible swinging boom that permits hydraulic positioning of the drill.

Known as the TDM-B1, the unit has full-range power positioning, drilling controls that are mounted on an arm that swings with the boom and an automatic hose reel. The new unit carries the maker's standard dual rotation drill. An independent, integral air motor provides hammerless rotation for coupling and uncoupling drill steel. Hydraulic power handles all positioning of the drill and feed. (Joy Mfg. Co., Oliver Bldg., Pittsburgh 22, Pa.)

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END

RP

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—Asphalt Mixing Plants
—Bagging Machines
—Bags
—Barges
—Belting, Conveyor
—Elevator, Power
—Transmission
—Belt, V-type
—Belt Repair
—Equipment
—Bin Level Indicators
—Blins and Batching
—Equipment
—Bits
—Blasting Supplies
—Bodies, Trailer

—Buckets
—Bulldozers
—Cars, Industrial
—Classifiers
—Clutches
—Cool Pulverizing
—Equipment
—Concentrating Tables
—Conveyors
—Crushers
—Coolers
—Cranes
—Derricks
—Dewatering Equipment,
—Sand
—Diesel Engines
—Dragline Cableway
—Excavators
—Draglines
—Dredge Pumps

—Drilling Accessories
—Drills
—Dryers
—Dump Bodies
—Dust Collecting
—Equipment & Supplies
—Electric Motors
—Engineering Service
—Consulting and Designing
—Explosives & Dynamite
—Fans and Blowers
—Feeders
—Fifth Wheel Heavy
—Duty Special
—Platation Equipment
—Front End Loaders
—Gasoline Engines
—Gear Reducers
—Generator Sets

—Grinding Media
—Gypsum Plant Machinery
—Hard Surfacing
—Materials
—Hoists
—Hoppers
—Kilns: Rotary, Shaft,
—Vertical
—Locomotives
—Lubricants
—Magnetic Separators
—Mills
—Pipe
—Pumps
—Scales
—Screen Cloth
—Screens
—Scrubbers: Crushed
—Stone, Gravel

—Shovels, Power
—Speed Reducers
—Tanks, Storage
—Tires and Tubes
—Torque Converters
—Tractor Shovels
—Tractors
—Trailer Dump Bodies
—Trucks, Bulk Cement
—Trucks, Industrial
—Trucks, Mixer Body
—Trucks, Motor
—Valves
—Vibrators
—Welding and Cutting
—Equipment
—Winches
—Wire Cloth
—Wire Rope

If equipment you are in market for is not listed above, write it in space below.

The principal rock product(s) manufactured by my company is/are indicated "1", "2", "3", in order of importance below.

—Crushed Stone
—Sand & Gravel
—Slag
—Cement
—Lime
—Gypsum
—Ready Mix Concrete
—Concrete Products
—Type
—Other nonmetallic mineral (What?)

All above information is strictly confidential to be used to guide the manufacturers in supplying proper information.

Please Check Service Desired

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NOTE: See—Where to Buy—Classified Advertising Section for used equipment and complete plant information

Name _____
Title _____
Firm _____
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City and State _____
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BUYER RESEARCH SERVICE DEPARTMENT:

ROCK PRODUCTS

79 W. Monroe St.
Chicago 3, Illinois



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in the black...
Specify
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RED-STRAND!

Black . . . the most attractive color in bookkeeping. There's no magic formula for staying in the black, but careful consideration of the right type and make of wire rope can cut costs substantially—10%, 20% or more.

RED-STRAND users are accustomed to longer-than-expected wire rope service, because higher-than-catalog-rated quality is built into the rope.

They know that Leschen distributors and field men make sure they have the best rope construction for the job at hand. They know, and you can too, that for wire rope and sling needs—specify RED-STRAND and stay in the black! For the name of your nearest Leschen distributor write: Leschen Wire Rope Division, H. K. Porter Company, Inc. 2727 Hamilton Avenue, St. Louis 12, Mo.

PORTER

**LESCHEN WIRE ROPE DIVISION
H. K. PORTER COMPANY, INC.**

MANUFACTURERS NEWS



Progress wore a canvas coat as Allis-Chalmers unveiled 9 new models of construction machinery at a "Power Parade" exhibit under huge tents on the grounds of the firm's local plant

A-C machinery exhibit—a "Power Parade"

Allis-Chalmers officials met with almost 1,000 dealers, company and press representatives at the opening of the company's "Power Parade" machinery exhibit recently. The dealers and the press came to inspect a fast-moving mobile display of 50 different models of new Allis-Chalmers construction equipment. Then groups of contractors accompanied by dealers came the following week.

The new units, ranging in size from 6,000 to 100,000 lb., were on display at the firm's plant

along with a 500-ft. long tent full of exhibits and cut-away models. Major new models on display included: (1) an experimental 700-hp. dual-engine motor scraper capable of scooping up and hauling 40 cu. yd. of dirt in a load; (2) a tractor loader with a lifting capacity of 25,000 lb.; (3) a tractor shovel weighing 73,000 lb. and specially designed for steel mills' slag removal operations; (4) a medium-sized, 105-hp. motor grader, and (5) a "small" motor scraper with a 13-ton carrying capacity.

New corporate name for McLanahan & Stone

The new corporate name of McLanahan & Stone Corp. has become McLanahan Corp. The

126-yr. old producer of pit, mine and quarry equipment made the name change largely to eliminate

the impression that it is a supplier of crushed stone, gravel or other materials. Also, the company's machines are referred to in the industry by the trade name McLanahan. McLanahan Corp. is a direct descendant of a company established in the Hollidaysburg, Pa., area in 1835.

Grede chairman of board for J. I. Case Co.

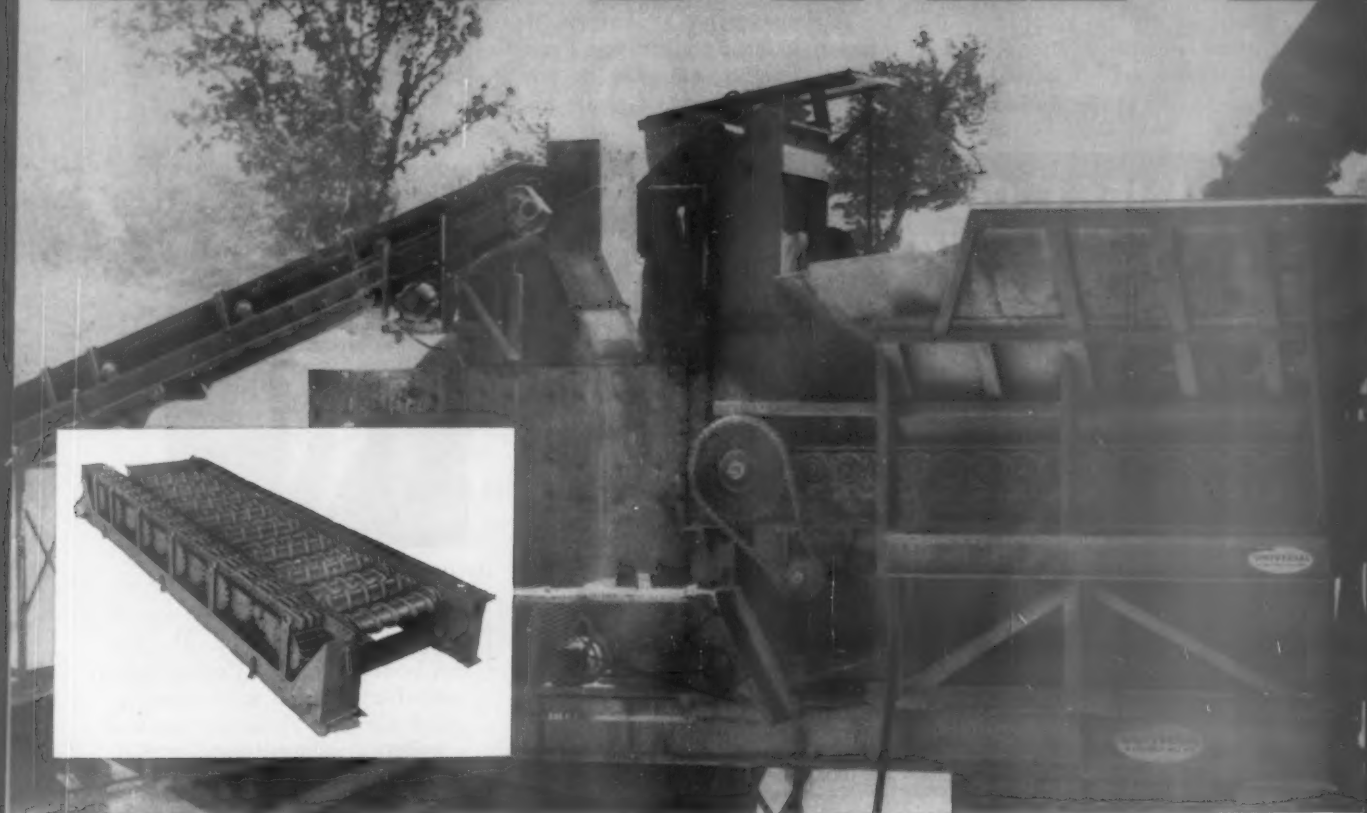
At a meeting of the board of directors of the J. I. Case Co., Racine, Wis., Wm. J. Grede was elected chairman of the board. He will continue to serve as president and chief executive officer. John T. Brown, who resigned as chairman, was elected vice chairman of the board and will serve as special assistant to the president. A former president of the National Association of Manufacturers, Mr. Grede was president of Grede Foundries, Inc., before assuming the presidency of Case in February. He is chairman of the board of Grede.

New name approved for Minneapolis-Moline

Stockholders of Minneapolis-Moline Co., Hopkins, Minn., approved a change in the corporation's name to Motec Industries, Inc., at their annual meeting. The name change, Edmund F. Buryan, president, said, was made so that the corporate name would reflect the diversified activities of the company.

Please turn to page 168

EXTRA



"WOBBLER FEEDER WORTH EXTRA \$100 A DAY TO ME"

According to Jack Patterson, President of Patterson Quarries, Inc., St. Charles, Minn., "The ability of the Wobbler Feeder to take out the bulk of fines, *wet or dry* and keep them out of the primary crusher is worth at least \$100 per day to me!"*

The Wobbler Feeder works equally well in wet or dry material. It will not plug, blanket or blind. And it operates with lower horsepower, lower maintenance.

Because the Wobbler so effectively takes out fines, it automatically reduces jaw or hammer wear and maintenance in the crusher!

These are the two big reasons why you'll make **EXTRA** profit with a Wobbler in your set up.

More reasons why a Wobbler Feeder will make **EXTRA** money for you.

- It will increase your overall production
- It will let you work in wet weather when other operations are shut down
- It requires less head room, less set up time, and will fit into your present system
- Performs smoothly, without vibration or excessive wear on component equipment



* For further details on the Universal Wobbler Feeder, write for illustrated brochure and reprints of Jack Patterson's article — "One New Plant is Good, Two are Better". Also send for new catalog telling the complete Universal systemized equipment story.



UNIVERSAL ENGINEERING CORPORATION

617 C Avenue, N.W., Cedar Rapids, Iowa

A Subsidiary of Pettibone-Mulliken Corporation, 4700 W. Division St., Chicago 51, Illinois

Manufacturers News

continued from page 166

Kuzmick elected vice president

Joseph N. Kuzmick, divisional manager of Manhattan Rubber Div., Raybestos-Manhattan, Inc., Passaic, N.J., and director of the corporation, has been elected vice president at the company's directors meeting. Mr. Kuzmick was appointed divisional manager April 1, 1959, and elected a

director of the corporation April 5, 1960. He has been with Manhattan for 42 years.

Barber-Greene & Telsmith

Barber-Greene Co., Aurora, Ill., has announced that its San Francisco branch office will now handle both Barber-Greene and

Telsmith products. Under the direction of branch manager, Marshall C. Ham, William F. Taylor will be branch sales manager for Telsmith products and will cover all of northern Calif. Service and parts facilities for the company's lines will also be handled from the San Francisco branch.

New corporation formed



The formation of a new company, Comco Corp., 5421 Lancaster Ave., Philadelphia 31, Pa., has been announced. Comco Corp. manufactures and markets equipment for the classification and conveying of materials. This equipment includes a system of vibratory screens and conveyors that transmit no vibration to their foundation. The company also manufactures a line of hydraulic classifiers and dewatering equipment. This line is used in the separation of particles in sizes from 6 mm. to 3 microns.

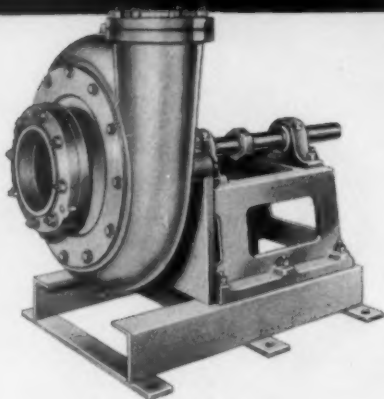
While the company's marketing area will include the whole Western Hemisphere, its equipment is manufactured in the United States. A national merchandising program is now under way. Distributors are being appointed.

Elected as the corporation's Vice President and General Manager is Austin K. Thomas, who will maintain offices at the company's headquarters.

LOWEST-COST HANDLING of FINE, ABRASIVE SOLIDS



RUBBER -LINED PUMPS



- No Adjustment Necessary
- Only 3 Wearing Parts
 - Semi-Open, Non-Clogging Impeller
- Stainless Steel Shaft
 - OUTLASTS METAL 5-10 Times on Slurries of 100% Minus 1/4"

LIGHTNING Model RU cuts costs on hydraulic transfer of silica sand, glass sand, coal silt and other fine, abrasive slurries. Initial efficiency remains steady without maintenance. The rubber lining, not affected by abrasion, outlasts any hard, alloyed metal. Model RU is available in 8x10", 6x8", 4x6", or 3x4" size. Its simple design insures maximum endurance and performance.

"Sixty years of service to the sand and gravel industry." We offer a complete line of pumps, including new ceramic-lined models. Write for full information.

The KANSAS CITY HAY PRESS COMPANY

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Bucyrus-Erie promotes Smith

Robert L. Smith has been named manager of sales promotion for Bucyrus-Erie Co., South Milwaukee, Wis., manufacturer of construction, mining and drilling equipment. He had been a sales representative attached to the firm's Chicago regional office for six years. In his new position Mr. Smith is in charge of the company's publicity, advertising, publications, sales literature and other sales aids.

New Canadian corporation

Formation of a new Canadian company, Wheelabrator Corp. of Canada, Ltd., has been announced by James F. Connaughton, chairman of the board. The new corporation is the successor to the Canadian Div. of Wheelabrator Corp. of Mishawaka, Ind., and was organized to handle expanding sales and fabricating activities for all provinces in Canada. Wheelabrator supplies airless blast cleaning equipment, abrasives, and dust and fume collection systems from its plant in Scarborough, Ontario. It also has an office in Montreal, Quebec.

Harold M. Miller is president and Robert A. Campbell is vice president and general manager. J. D. Lamb is the general sales manager.

Pacific Lift Truck Co. Rep. for Yale & Towne

Pacific Lift Truck Co. has been appointed the Yale representative in Southern California according to a joint announcement by Horace H. Fritz, III, president of Pacific, and Louis W. Jander, general sales manager of Yale Materials Handling Div., The

Yale & Towne Mfg. Co. As franchised representative, the West Coast company will assume management of the former Los Angeles branch of Yale & Towne. It will also operate the Yale San Diego sales and service location. Both locations will have full sales and service departments.

Please turn to page 170

KOLMAN MODEL 101 PROVES VERSATILE AS AGGREGATE PRODUCTION UNIT



Extra Big Multi-Deck
Screens Give High Capacities
on Portable Plant

KOLMAN
COMPLETELY PORTABLE
CONVEYOR-SCREEN PLANT
CONVEYOR • SCREEN • TRAP • FEEDER

48" x 10' KOLMAN TRIPLE-DECK Screen on 50' x 42" Model 101.

With a choice of single, double, or triple deck screens on the KOLMAN Model 101 Portable Conveyor-Screen Plant, a variety of operations in the production of aggregate can be performed easily and economically. Making specification material, pre-screening ahead of crushers, scalping and rejection, classifying, washings, blending, or simply high-speed loading—all are efficiently accomplished with this rugged, low cost plant.

And complete versatility is provided through the wide choice of feeding accessories available on a KOLMAN Plant. Push Loading operations are handled with a Dozer Trap or a Feeder-Trap Combination—"Top Loading" with Hopper or Feeder-Hopper Combination and a Conversion Hopper for Traps makes either Push Loading or Top Loading feasible with the same plant.

Send for more details about how KOLMAN Plants, as well as other KOLMAN aggregate equipment, can fit into your materials producing picture. You'll be glad you did.



Above, 5' x 12' double-deck screen on Kolman 101.



Left, two 5'x12' single-deck Kolman screens were mounted on 60'x42" 101 conveyors to produce over 2,000 t.p.h. of minus 1½" base course gravel.

Write for Literature

KOLMAN MFG. CO.

4200 West 12th St.

Sioux Falls, South Dakota

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HAYWARD CLAMSHELL BUCKETS

**WORK LONGER,
WORK FASTER,
WEAR LESS!**

Designed with rugged, one-piece alloy shells... wide type, cast manganese steel cutting edges... smooth shell interior for fast, capacity loads and easy discharge... manganese bushings... diagonal truss brace to keep shell in line... has no side sway or back lash... plus many other cost-cutting design features!

Get complete details. Write today for illustrated bulletin.

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Builders of Better Buckets Since 1888

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ONLY "TELLTALE" PUMPS WARN WHEN IT'S TIME TO RELINE

NEW Type D-T Heavy-Duty "TELLTALE" Centrifugal Sand and Gravel PUMP



No time-wasting look-see at the pump's insides necessary. Water leaking through the parts between the bolted halves of the outer shell tell the tale of a shell liner worn through.

When the shell liner wears through, sand and gravel quickly eat through the rope-type packing between shell liner and the shell. Hence the telltale leak.

**AS LOW IN DOWNTIME AS IT
IS HIGH IN PRODUCTION**

The useful and exclusive telltale feature is one of all the best retained in the latest "Telltale" pump, only type we now manufacture.

Some new features: New highs in production—new lows in downtime, because of simple foolproof assembly for changing parts—also "Telltale's" own.

Available with either tough semi-steel or best-in-the-long-run Ni-Hard wearing parts in 4", 6", 8", 6 x 8" suction and 8 x 10" suction. Now available also in either alloy, 45 and 90° extra-heavy long-radius flanged elbows. Write for Type D-T Heavy Duty folder and prices.

PEKOR IRON WORKS, INC.

ESTABLISHED 1892

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FAIRFAX 2-4020

COLUMBUS, GEORGIA

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Manufacturers News

continued from page 169



Oberlink elected Road Show chairman

The Board of Directors of the Construction Industry Manufacturers Assoc. (CIMA) have announced the appointment of Boyd S. Oberlink as chairman of the Administrative Committee for the 1963 Construction Equipment Exposition & Road Show. Mr. Oberlink is well known in the industry and is vice president of the Allis-Chalmers Mfg. Co., Milwaukee, Wis. He has served on the Board of Directors of CIMA and is a past president of the organization. The show is scheduled to open Feb. 23, 1963, at the International Amphitheater, Chicago.

Hartig vp and general mgr. Yale Materials Handling Div.

The election of Paul R. Hartig as vice president and general manager of the Yale Materials Handling Div. of Yale & Towne Mfg. Co., New York, was announced by Gordon Patterson, president. Mr. Hartig will make his headquarters at the Philadelphia plant. He is the third vice president elected since Mr. Patterson became president of Yale & Towne last July. Before joining the company, Mr. Hartig served for six years as general manager of General Electric's Insulator Dept.

Long-term sales-leaseback plan for plant and equipment

A new plan, by which stone and cement producers can sell their existing plant and equipment and immediately lease it back for terms of from 3 to 12 years, was announced by Nationwide Leasing Co., Chicago, Ill.

This plan was designed specifically for firms which have an over-large investment in fixed assets and whose growth, as a result, was being hampered by tight working capital. Special feature of the plan is that it will be possible to sell, for cash, fully or partially depreciated equipment to Nationwide at greater-than-book-value and lease it back. Every type of production and office equipment is included in the leaseback plan.

Spring meeting at Little Giant Crane

Little Giant Crane & Shovel, Inc. held their spring Sales & Service School at the headquarters plant in Des Moines, Iowa. These meetings are held semi-annually, keeping distributors informed on new product engineering and design. The company feels that such meetings offer the important opportunity for distributors from the U.S. and Canada to exchange ideas, and that this is of greater mutual benefit than smaller district meetings. The 1961 New Equipment Showing was held simultaneously at the demonstration yard.

New organization formed

The combined facilities of Atlas Copco Eastern of Paramus, N.J., and Atlas Copco Pacific, San Carlos, Calif., have merged to form a new organization known as Atlas Copco, Inc.

END

SINCE 1885—(PIONEERS) MANUFACTURERS OF IMPACT CRUSHERS

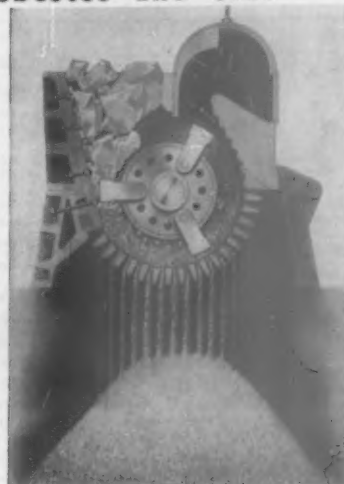
LOWER COST reduction of limestone, shale, bauxite, gypsum, coal, asbestos and ores

GRUENDLER IMPACT CRUSHERS

High tonnage production in ONE OPERATION on many materials with low power requirement. Adjustable heavy duty breaker plates and grate bars for rapid discharge of uniformly and specifically sized crushed material. Heavy cast alloy steel frames, manganese impact hammers, roller bearings and automatic lubrication for a lifetime of service.



400 tons per hour capacity IMPACT HAMMER CRUSHER on assembly line. Gruendler Impact Crushers are available in a wide range of sizes and capacities.



Interior view. Equipped with rigid impactor rotor or with free swinging manganese hammer rotor. Other model impact crushers are equipped with traveling breaker plates for force feeding and longer breaker plate life.

Write us for bulletins and information. State the nature of the materials to be crushed, the sizes of finished product and hourly tonnage desired. Manufacturers of JAW CRUSHERS, SINGLE & DOUBLE ROLL CRUSHERS, SCREENING and MATERIAL HANDLING EQUIPMENT.

GRUENDLER CRUSHER & PULVERIZER CO.
Dept., RP 661, 2915 North Market St., St. Louis 6, Mo., U.S.A.

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**A NEW BOOK by
JAMES A. NICHOLSON**

**GIVES YOU
THE SCORE**

Single Copies only \$5.00 each.

Five to twenty copies \$4.00 each.

"Ready Mixed Concrete", is an historical, authoritative account of one of the fastest growing industries in the world.

Written especially for people in the *Ready Mixed Concrete Industry* the book is a harvest of factual information on every fundamental phase of the business.

Give a copy to every employee who has a hand in YOUR reputation for quality mixes, and in YOUR profits. Order your copies today.

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PRODUCTS**

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READY MIXED CONCRETE By J. A. NICHOLSON
Enclosed is my check (money order) for \$.....
Please send at once copies to:
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WHERE TO BUY

You may find just what you're looking for in the used equipment, employment and professional advertisements below. Box numbers are confidential and advertisers' names will not be disclosed. Send replies to: Box Number (shown on ad), c/o ROCK PRODUCTS, 79 W. Monroe St., Chicago 3, Ill. All replies will be forwarded to advertisers daily.

LIQUIDATIONS CEMENT PLANTS OHIO & PENNA.

FEATURED ITEMS

- 1-Raymond #6669 High Side & Roll Mill with Flash Drying System, 200 HP motor, 7' dia. double whizzer, complete with cyclones and dust collector.
- 1-Dixie Non-Clog Mogul Hammermill #5040, 200 HP with 36" pan feeder.
- 2-Bradley Hercules 60" Mills, with 350 HP motors.
- 1-Allis Chalmers 7' x 120' Rotary Kiln, 1/2" shell, all welded, 2 tires, complete.
- 1-Link Belt 30" x 145' Troughing Belt Conveyor, reducer and motor.

AIR SEPARATORS

- 2-Raymond 16' and 14' dia. single whizzer.
- 2-Sturtevant 14' dia. with 75 HP motors.
- 1-Raymond 12' dia. double whizzer, 50 HP.

KILNS & DRYERS

- 1-Allis Chalmers 9' x 130' Rotary Kiln, 1/2" shell.
- 6-Vulcan 8' x 125', 8' x 100' Rotary Kilns, 1/2" shell.
- 2-Vulcan 8' x 90', 8' x 80' Rotary Dryers, 1/2" shell.
- 1-Vulcan 7' x 80' Rotary Dryer, 1/2" shell.

FULLER-KINYON PUMPS

- 1-8" type B with 75 HP motor.
- 1-7" type H with 75 HP motor.
- 1-6" type E with 50 HP motor.
- 1-5" type H with 25 HP motor.
- 150"-8" Fuller Huron Airslide with Spenser Blower.

MILLS-PULVERIZERS

- 1-Traylor 7' x 27' Compab Mill, with 500 HP motor.
- 5-Allis Chalmers 5' x 22' Tube Mills, with 200 HP motors.
- 3-Harding 5' x 22' Conical Ball Mills, with 60 HP motors.
- 2-F. L. Smith 8' x 5' Komminuters with 150 HP.
- 1-Pennsylvania Super-Thor Hammermill, SXT-13 with 250 HP motor.

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COMPANY**

Send for detailed circular.

35-57 Jabez Street
Newark 5, N. J.
Tel: Market 3-7420

JAW CRUSHERS

60"x48" to 6"x3"
New and used **RELIABLE**



"Farrel-Bacon"
Jaw Crushers

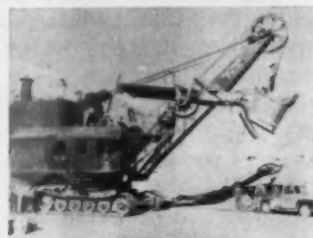
BACON-PIETSCH CO., INC.
26 Park St., Montclair, N.J.
29 Washington Ave., Hamden, Conn.
Phone Montclair—Pi 6-1300

FOR SALE

- 2-Bonnet rotary kilns, 8' x 115', complete with motors and drives and all auxiliary equipment, 3/4" material.
- 1-Bonnet steel rotary cooler, 8' x 50', complete with drive and motor, 3/4" material.
- 1-Raymond 2 roll high side mill with oil journals, complete with air separator and fans, etc.

R. GELB & SONS, INC.
U.S. Highway 22, Union, N.J.
Murdock 6-4900

USED BARGAINS



170 B Bucyrus Erie Shovel

SHOVELS

- 1-7 yd. Bucyrus Erie Model 170 B Electric, ESCO Bucket, 2400/4160V Volts, w/ Retracable.
- 1-4 yd. Marion Model 111-M Diesel Electric Twin GMC Diesels, air controls, complete with 100' Dragline Boom and Bucket.
- 1-2 yd. Bucyrus Erie Model 54B, Dragline only, 2 yd. ESCO Bucket.

CONVEYORS

- 1-60" x 150' Lattice Type Steel Frame Vertical Gravity Takeup, 100 HP. Westinghouse gearmotor, 440 V., 11 ply belting.
- 1-42" x 1250' Link Belt Steel Frame, Gravity takeup, 2-100 HP. Westinghouse Gearmotor, 440 V.
- 1-42" x 870' Link Belt Steel frame, complete with 70' long Conveyco Mobile Stackers, 100 HP. Westinghouse gearmotor, 440 V.

SCREENS

- 1-9' dia. x 54 1/2" Yuba Heavy Duty Trommel Screen, 100 HP. Westinghouse Motor, Complete.
- 1-6' x 14' Hewitt Robins, Model MH-11 Vibrex heavy duty Scalping Screen, single deck, 20 HP. Elliot Motor TEFC, 440 V.

FEEDERS

- 2-60" x 16'-3" Pioneer-Oro Apron Feeders, Extra Heavy Duty, Supermang Pans, 20 HP. U.S. Varidrive motors, 2100 TPH.
- 2-24" x 72" Jeffrey 4H Vibrating Pan 440 V. w/16SRM Rectifier Control.

MACHINERY CENTER, INC.

1201 SOUTH 6TH WEST
HU 4-7601
SALT LAKE CITY 10, UTAH

FOR SALE

- EUGLID: Rear, Bottom and Scrapers
- 450W Bucyrus-Erie Drag, 14 yd.
- 8 yd. Bucyrus-Erie Electric Shovel
- 9W Bucyrus-Erie Dragline, 2 1/2 yd.
- 7W Bucyrus-Erie Dragline, 7 yd.
- 5W Bucyrus-Erie Dragline, 5 yd.
- 200W Bucyrus-Erie Dragline, 8 yd.
- 170B Bucyrus-Erie Shovel, 6 1/2 yd.
- 120B Bucyrus-Erie Shovel, 5 yd.
- 34B Bucyrus-Erie Shovel, 2 1/2 yd.
- 36B Bucyrus-Erie Shovel, 1 1/2 yd.
- 60D Northwest Shovel, 2 1/2 yd.
- 4500 Manitowoc Dragline, 5 yd.
- 2400 Lima Dragline, 6 yd.
- 1201 Lima Dragline, 3 yd.
- 1 1/2 yd. Marion Shovel. New in 1958.
- 2400 Marion Walking Dragline, 9 yd.

SHOVELS-DRAGLINES-CRANES

(All sizes, makes, crawler and walking type)
WILLIAM LUBRECHT, III
CONSTRUCTION EQUIPMENT
311 W. Diamond Ave., Hazlet, Penna.
Telephone GLadstone 5-4041 or 5-0253

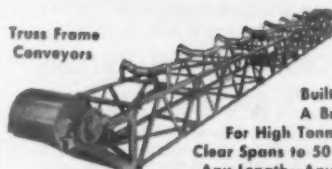
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WRITE, PHONE, OR WIRE FOR FREE CATALOG
LARGE STOCKS—IMMEDIATE DELIVERY

BONDED® TROUGHING IDLER CONVEYOR BARGAINS



3" Jr. I Beam Frame Conveyors



Truss Frame Conveyors

Built Like A Bridge
For High Tonnages
Clear Spans to 50 Ft.—
Any Length—Any Belt
Width

Complete Pre-Fab sections of 3" Jr. I-beam Frame and 30" Deep Truss Frame Conveyors which are manufactured for quick and easy assembly on the job site. Equipped with 5" diameter troughing idlers and return rolls, 38" diameter head pulley and 16" diameter tail pulley.

Prices include conveyor complete with 4-ply, 28 oz. duck MAJOR BRAND belt with 1/4" x 1/32" rubber covers. Other lengths priced on request.

WRITE FOR BULLETINS No. 1138 and No. 1189.

Belt Width	Conveyor Length	I-Beam Frame Price	Truss Frame Price
14"	25'	\$ 766	\$ 965
14"	50'	1181	1516
14"	85'	1783	2273
16"	25'	790	875
16"	45'	1128	1434
16"	60'	1394	1779
16"	90'	1897	2442
16"	150'	2923	3788
18"	25'	830	1104
18"	45'	1190	1572
18"	70'	1641	2155
18"	100'	2182	2862
18"	130'	2723	3565
18"	165'	3254	4285
20"	25'	871	1170
20"	60'	1346	2016
20"	75'	1826	2388
20"	90'	2125	2760
20"	135'	2993	3874
24"	25'	922	1200
24"	45'	1325	1721
24"	70'	1852	2377
24"	100'	2473	3100
24"	120'	2886	3623
24"	150'	3587	4467
24"	170'	3920	4990
30"	50'	1591	2018
30"	70'	2054	2594
30"	90'	2518	3176
30"	100'	2749	3450
36"	25'	1165	1393
36"	45'	1623	2094
36"	60'	2012	2497
36"	100'	2948	3758

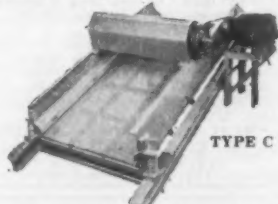
BONDED® HEAVY DUTY MOBILE CONVEYORS

- FAST ECONOMICAL HANDLING OF BULK MATERIAL
- AVAILABLE WITH SCREEN AND FEEDER
- RUGGED 30" DEEP TRUSS FRAME
- HIGH TONNAGE AT LOW COST
- EQUIPPED WITH TOW HITCH



The economical solution to the need for a heavy duty conveyor that can be readily moved from one job-site to another. Available with mast or mastless type undercarriage and hydraulic powered mechanism. All standard conveyor accessories can be used. Lengths to 60 feet and belt widths through 30 inches. Write for catalogue.

BONDED® SPECIAL SERVICE AND HEAVY DUTY VIBRATING SCREENS



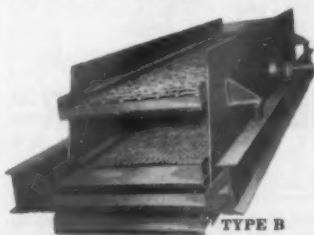
TYPE C

WRITE FOR BULLETIN #1224

For scalping middle-range pieces and accurate sizing of fines where quantity and feed do not warrant a larger capacity, heavy duty model. Medium to heavy construction. Can also be suspended from four steel cables and springs for portable or temporary installation. Vibration remains in working screen body. No shaking of tipple, building or platform.

Priced from\$487

WRITE FOR "SEVEN SECRETS OF SUCCESSFUL SCREENING" IN BULL. 1086



TYPE B

FACTORY BALANCED, CONTROLLED VIBRATION. Four bearing, positive throw eccentric shaft: 3' x 6" to 5' x 14". 1 to 5 decks. WRITE FOR BULLETIN No. 1087 and "9 REASONS WHY BONDED IS YOUR BEST BUY."

For high tonnages, heavy scalping and multiple sizing of minerals and industrial products. No dead spots. Springless live-rubber mounting of screen body controls vibration. Screen cloth and plate in all models reversible for longer life. PRICED FROM\$1620

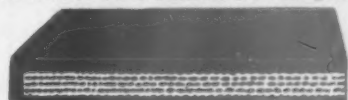
TESTED CONVEYOR BELTING

WE PAY FREIGHT ON 200 POUNDS OR OVER.

QUANTITY DISCOUNTS ON 200' OR OVER UPON REQUEST

All belting is tested by the Engineering Laboratory of one of the largest universities in the United States. It is guaranteed to meet or exceed listed specifications.

Other widths, piles, duck weights and cover thickness available at low prices. WRITE FOR FREE SAMPLE & BULL. #1279



MAJOR BRAND: 12" to 15" Friction Pull. 2000# to 10000# Cover Tensile. Heavy Duty. 28 oz. duck. 1/4" top x 1/8" bottom rubber covers. Tough cotton duck, strong carcass and proper flexibility. Used in moving boxes, bags, coal, sand, gravel, crushed stone, salt, earth and similar materials.

Width	Ply	U. S. Made Per Foot
14"	4	\$3.66
16"	4	3.21
18"	4	3.56
20"	4	4.11
24"	4	4.61
36"	4	5.64
36"	4	6.69

MAJOR BEE BRAND: 16" to 19" Friction Pull. 2400# to 3000# Cover Tensile. Skim Coat Between Plies. A high grade of heavy duty, 28 oz. duck with 1/4" top x 1/8" bottom rubber covers. For severe service and abrasion resistance. For stone, mineral ores, concrete, cement and coal.

Width	Ply	U.S. Made Per Foot	Imported Belt Per Foot
14"	4	\$3.31	\$3.17
16"	4	3.74	3.36
18"	4	4.14	3.73
20"	4	4.72	4.32
24"	4	5.35	4.86
30"	4	6.56	5.98
36"	4	7.95	6.95
24"	5	6.25	5.63

The Following Have 1/4" Top Rubber Cover x 1/8" Bottom Rubber Cover:

Width	Ply	U.S. Made Per Foot
12"	3	\$2.31
18"	3	3.23
24"	3	4.24

WRITE US FOR YOUR CHUTE LINING REQUIREMENTS.

CHUTE LINING is of high-tensile, abrasion-resistant quality. Recommended for Chutes and Launder Lining, Conveyor Belt Scrapers, Conveyor Skirt Boards, Die-Press or Bumper Stock Hoppers, Bins and other metal surfaces exposed to the action of abrasion materials.

BONDED® IDLERS & RETURN ROLLS FOR UTMOST ECONOMY



3-roll, 5" diameter Troughing Idlers for:

14" belt	\$19.75	24" belt	\$22.75
16" belt	20.50	30" belt	23.85
18" belt	21.90	36" belt	24.90
20" belt	23.10	48" belt	27.50

1-roll, 5" diameter Return Rolls for:

14" belt	\$ 8.50	24" belt	\$11.00
16" belt	9.00	30" belt	12.50
18" belt	9.50	36" belt	13.75
20" belt	10.00	48" belt	16.50

All steel. Interchangeable with other well-known makes. Furnished with replaceable pre-lubricated sealed ball bearings. Maintenance is negligible. WRITE FOR BULLETIN #1188.

BONDED SCALE AND MACHINE COMPANY

PHONE Days: Hickory 4-2186

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PHONE Evenings: AX. 1-2213 or Temple 7-4519

128 Bellevue

Mfrs. of Conveyors, Conveyor Parts, Idlers, Vibrating Screens, Crushers, Feeders and Bucket Elevators COLUMBUS 7, OHIO

WHERE TO BUY

continued . . .

MAKE MONEY BUY THIS EQUIPMENT

QUARRY EQUIPMENT

Cedarapids 4A 2540 primary
Cedarapids 3B 1036 scalper
Cedarapids 3C 4024 secondary
Telmith 5335 Primary Crushing Plant
Pioneer 300W Washing & Screening Plant
Cedarapids #3 Kubit Breaker. Rebuilt.
Cedarapids 1698 plain bearing jaw
Farrell 6 1/2 x 12 Blake type jaw
Telmith 403 secondary gyratory
Kennedy 37 1/2 Clearless Gyratory. New Condition
Cedarapids 3033 Hammermill. Rebuilt.
Cedarapids 2633 Hammermill. Rebuilt
2-150KVA, 340-480 V. generator sets, Murphy power
Cedarapids 16' open inclined bucket elevator
Telmith Pulaski, 4' x 12'. 3-deck screen
Telmith Vibro-King, 4' x 12'. 3-deck screen
Cedarapids 5' x 12'. 3-deck-Riprap screen
Cedarapids 42" x 18" Apron Feeder.
2-Symons F-44 Vibratory Feeders
Eagle 30" x 25" Washer Classifier-Dehydrator
Cedarapids 30-8, 3-comp. charging hopper.
Smithco 18-Yd. Portable Charging Bin
8' x 12', 8' x 18', 12' x 20' bins in stock
18", 24", 30", 36" conveyors & beltng

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Lorain L-26, 3/4-yd. Diesel Backhoe
Lorain TL-30, 1/2-yd. Gas Shovel or Hoe
Lorain MC546, 45-ton Moto-Crane. New Cond.
Lorain SP-434, 23 1/2-ton Self-Propelled Crane
Lorain MC-414, 20-ton Moto-Crane
Lorain MC-394, 15-ton Moto-Crane
Lorain SP-110, 18-ton Self-Propelled Crane
Lorain TL-20-MC, Moto-Crane

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Euclid 12-yd. Bottom Dumps. Good. (2)
Caterpillar D-7 with Hydraulic Angledoser
Caterpillar D-8 with Hyd. Angle Blade.
Caterpillar D-4 Tractor Only
Euclid 7-yd. Overhung Engine Scrapers (3)

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DRILLS

Mayhew 10W Down the Hole Drill, Trk Mtd.
Demonstrator
Gardner-Denver DH123J Air Trac Drill. Rebuilt
Gardner-Denver ATD-3000 Air Trac with
FH123J Drill. New Cond.
Sanderson Cyclone 43 Well Drill, Trk Mtd.
Bucyrus-Erie 22W Well Drill, Trk Mtd.

AIR COMPRESSORS—PORTABLE

Gardner-Denver 600' Rotary Diesel
Gardner-Denver 385' Rotary Diesel
Chicago Pneumatic 315' Air-Cooled Diesel. Recond.
2-Gardner-Denver 125' Rotary Gas
Ingersoll Rand 185' Air-Cooled Gas. Recond.
Daver 160' Air-Cooled Gas. Recond.
LeROI 105' Tractair with Doser, Backhoe, Shovel

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Adams 412H Diesel Grader. Reconditioned
Lorain ML-183, 1 1/2-yd. Diesel Wheel Loader

L. B. SMITH, INC.

Camp Hill, Pa.

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FOR SALE OR RENT

40 ton American #408 Diesel Loco. Crane. Cat. D17000 eng. 1943.
25 ton Ind. Brownhoist #5 Diesel Loco. Crane. New 1942.
30/50 ton Amer. Stiffleg Derrick.
200 HP Amer. #180 3D elec. hoist and 15 HP Amer. swinger.
65 ton Gen. Elec. 400 HP Diesel Loco.
45 & 25 ton Gen. Elec. Diesel Locos.
1 yd. Lorain L-50 Crane-Drag. 1951.
1600 cfm Chic. Pneu. V-type Compressor.

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1905 Railway Exchange Bldg., St. Louis 1, Mo.

ROT. DRYERS—KILNS

10' x 11' x 175' Vulcan Kiln, 1 1/2"
10' x 78' National dryers, 3/4"
8' x 80' x 70' Hardinge 3/4" welded.
8' x 8' Traylor dryer, 3/4" welded.
8' x 60' rotary kiln, 1/2" welded
8' x 60' Davenport, 1 1/2" welded
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8' x 40' Stearns-Roger dryers, 1/2"
7'-6" x 100' kiln, 1/2" shell.
7'-6" x 62' kiln, 1/2" welded
7' x 60' Bonnet dryer, 3/4"
7' x 54' Vulcan dryers, 1/2" shell.
6' x 7' x 100' kiln, 1/2" shell
6' x 52' Bonnet dryer, 1 1/2"
6' x 50' Louisville steam-tube
6' x 25' Louisville steam-tube
4'-9" x 32' dryers, 3/4" shell
4'-6" x 40' Ruggles-Cole dryer
3' x 23' Standard dryer, 1/2"

SACRIFICE!

8' x 60' Davenport rot. dryers, 1 1/2" welded, late model, complete!

PERRY



ROCK
PRODUCTS
EQPT. DIV.

8' x 60' x 1/2" Welded Rotary Kiln
6' x 120' x 1/2" Vulcan Rotary Kiln
4' x 35' Rotary Dryer New Shell
4' x 47' x 3/4" Mosser Rotary Dryer
6' x 25'; 6' x 50' Louisville Rotary Dryers
8'8" x 70' Ruggles Cole Dryer
8' x 11' Traylor Ball Mill Steel Lined
7' x 24' Allis-Chalmers Tube Mill
#5060 Dixie Mogul Hammermill
SX13 Penna. Hammermills, 400 HP
Heil Patterson Crushers, 100 HP
Raymond #50 & #40 Impact Mills
36" x 42" Koppers 2 Roll Crushers
36" x 48"; 20" x 6" Jaw Crushers
3'x3'x12' Horiz.; 4'x9'x12' Vert. Puggers
27" x 24" Komarek-Greaves Brig. Presses
20"x40"; 30"x96"; 40"x84"; 60"x84" Screens
535'-24" Traughing Belt Conveyor
Bucket Elevators 45' to 90' Centers
Sweco Separator 48" 3—SS

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3-10'x78' Dryers—2'3'4'5'1/2'7' Symons and Tel-smith Cone Crushers—3648-4042-4872 Jaw Crushers and smaller sizes—48" & 20" Gyratory Vibrating Feeders—other types of Feeders—Eagle Fine & Coarse Material Washers—Dixie Non Clog moving plate Hammermills—Asphalt Plants—Jaw—Cone—Gyratory—Roll Double and Triple—Hammermill and Impact Crushers—Ball—Rod—Tube Mills—Screening, Washing and Crushing Plants, Classifiers Compressors, Conveyors, Cranes, Drills, Dump Cars, Dredges, Feeders, Hoists, Motors, Generators, Kilns, Dryers, Locomotives, Pumps, Screens, Shovels, Draglines, Transformers, Euclid Trucks.

STANLEY B. TROYER EQUIPMENT CO.

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546-5954

Box 97, Crosby, Minn.

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BALL & ROD MILLS

Denver 4' x 10' rod mill, 60 HP.
Hardinge 8' x 48" conical pebble, 75 HP
Hardinge 7' x 36" conical pebble
Hardinge 6' x 36" conical ball mill.
Allis-Chalmers 6' x 18" pebble-tube
Allis-Chalmers 6' x 16" ball-tube
Allis-Chalmers 5' x 22" ball-tube
Bannon 5' x 10' ball mill, 75 HP.
Allis-Chalmers 5' x 5' ball, 75 HP

CRUSHERS—PULVERIZERS

Farrel 36" x 15" jaw crushers
Buchanan 24" x 13" jaw, 50 HP
Farrel 20" x 6" jaw, 30 HP
Mitchell 18" x 9" jaw, 25 HP
Babcock & Wilcox #32E ball type pulv.
Raymond 66" 6-roller mill, 200 HP
Raymond 50", 5-roller, hi-side mill
Dixie #5060 hammermill, 500 HP

EQUIPMENT CORP.
1418 N. Sixth—Phila. Pa.
Phone POplar 3-3505

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695' Chgo. Pneu YCB-100 HP 220/440 V.
6—Inger Rand, 1350, 2200, 3000 & 3800
DIESEL LOCOMOTIVES, CRANES & CARS
18—115, 100, 80, 70, 65, 45, 25, 20, 10 & 8
ton GE & GM & Plymouth Diesel Locomotives
500—50 & 70 ton Gondola & Box Cars
500—50 & 70 ton Ore Cars
25 ton Amer. Diesel Loco Crane
ROTARY DRYERS & KILNS
7' x 120' Allis Chalmers Rotary Kiln 3/4"
Welded Shell
6' x 48', 6' x 72', 8' x 60', 9' x 160', 10' x 78'
8' x 125' & 36" x 30' Ruggles Rotary Kilns
2', 3', 4', 5 1/2' & 7' Symons Cones
REDUCTION MILLS & FEEDERS, SCREENS
40 x 33 Cedar Rapids Hammermill
2020 & 3645 Double Impact Breakers
4 x 8, 4 x 12 & 6 x 16 Vib. Screens
6' x 9' Traylor Ball Mill w/motor
5' x 5' & 6' x 4' CIW Ball Mill w/motor
5' x 10', 6' x 12" & 7' x 15' Rod Mills
2—KVS 5' x 8' Ball Tube Mills Air Swept
4' 0" Traylor Type TY-Gyratory
18" x 36", 13" x 24", 24" x 36" Jaw Crushers.
48", 20" Traylor Primary Gyratory Crushers
2—20" Allis-Chalmers S.M.C.C. Gyratory Crs.
8' x 10', & 20" x 36" Pioneer Jaw Crushers
2A Cedar Rapids Port. 24 x 16 Roll Crusher
14x28, 12"x26" & 9"x24" Cedar Rapids Jaw
48"x60", 48"x72" & 66"x84" Jaw Crushers
46" Stedman Double Cage Disintegrator
24" x 14" Allis Chalmers Style B Double Roll
Bradley Hercules Mills (3) Type 6000
PSS Syntrol Grizzly Feeder
2—6' x 12' AC Rip-Flt Double Deck Screens
2' x 6' & 3' x 12' Saco Single Screen
6—30" x 32" Ding's Magnetic Head Pulleys
3—200 HP & 160 HPSP. Ottumwa Elec. Hoists.
ELEC. WHIRLEY CRANES
2 Amer. R20-60 Ganty 139' Boom
WANT KILNS—DRYERS—CRUSHERS
R. C. STANHOPE, INC.
60 E. 42nd St., N.Y. 17, N.Y.
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BOUGHT BUT NEVER USED

MORRIS—6" Sand Pump with GM model 3061A diesel engine. Plus one year supply of spares.

ALLIS-CHALMERS—4" x 3" CWI pump unit, 400 GPM @ 115' head, with 30 hp Wisconsin gas engine. Plus one year supply of spares.

DENVER—3" x 3" SRL pump unit, 150 GPM @ 100' head, with 20 hp Wisconsin gas engine. Plus one year supply of spares.

Technical Equipment Corporation
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- 1-Raymond Super High Side 6 Roll Mill, #73612 complete with motors, fans, whizzer, cyclone, piping. (1952)
 - 2-57" Fuller Lehigh Mills with 150 HP motors.
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 - 2-10' x 80' Rotary Dryers, 1 1/4" shell.
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 - 2-6'6" x 60' Rotary Dryers, 1/2" shell.
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- 140 GPM, 100 Ft head, Gorman-Rupp portable pumps driven by 9 HP, Wisconsin Gas Engine.
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- 700 GPM, 100 Ft head, Morris, 25 HP motor.
- 75 KW Diesel-Electric generator, 3/60/440 volts.

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TRAILMOBILE TRAILERS

4 Model ID-66
15 cu. yd. Rear Dumps. 1958

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ALL NEW SINCE 1957

7'x26' ALLIS CHALMERS BALL MILL

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90 West Broadway

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Gyratory or Cone Crushers—Small—
#322 Allis-Chalmers, 2' Symons and
#25 1/2 S Kennedys—Also—Roller Bearing
Jaw Crushers up to 12x24.

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Robins Vibrex Screen 4' x 6'
Niagara Single Deck Screen 4' x 14'
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Jeffrey-Traylor #4 Vibrating Feeder with
Controller.
9" Screw Conveyor Complete with Ends,
Hangers, Gearmotors (250' available)
14" to 48" Used Idlers
24" to 36" Used Belt
Denver Lab. Jaw Crusher 3 1/4" x 4 1/2"
Farrel Lab. Jaw Crusher 6" x 2"
Farrel Jaw Crusher 24 x 13B
Farrel Jaw Crusher 36 x 18
Good Roads Jaw Crusher 5 x 12
New England Jaw Crusher 14" x 28"
Acme Jaw Crusher 14 x 26 Steel Frame
Cedar Rapids Jaw Crusher 9 x 24
Champion #5 Jaw Crusher 12 x 26
Sturtevant #1 & 1 1/2 Rotary Crushers

G. A. UNVERZAGT & SONS INC.
136 Colt Street Irvington 11, N.J.
Essex 3-8105

DRAG SCRAPER UNIT: Sauerman Drag Scraper Unit complete, 2 yd. capacity, Crescent bucket, 75 H.P., 440 volt motor and all auxiliary equipment. Condition like new.

CRUSHERS, JAW: One Allis Chalmers 40 x 42" with 150 H.P. V-belt drive motor and controls, with or without heavy duty Apron Feeder 42" x 14 1/2" with motor, reducer and drive, condition guaranteed. One Allis Chalmers 24 x 36" and one 18 x 30". One Traylor 15 x 24". Other crushers 8" x 10" to 48" x 60".

CRUSHER, GYRATORY: One Telsmith 16-B.

CRUSHERS, ROLL: One Sturtevant 16" dia., 4" face. One 24" x 54" Pioneer, roller bearing type, with 125 H.P. 220/440 volt motor.

CLASSIFIERS: Two Wemco and Akins type SH, 48" x 26 1/2" and two 48" x 20 1/2". One Wemco Densifier type SH, 36" x 18", complete with drive and lift motors.

PULVERIZERS: Jeffrey 20 x 12 type B, 20 H.P. motor, new condition. One Pebble Mill type B, 8'6" x 7 ft.

HOIST & DERRICK: American 115' mast, 100' boom, 30 tons capacity @ 100 ft., complete, new 1957, with or without American hoist, new 1957.

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Lansdowne Theatre Building
Lansdowne, Pa.

Phila. Phones: MAdison 3-8300—3-8301

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Link Belt LS-85 Shovel

Unit 514 Backhoe 3/4 yd.
Inaley K-12 Dragline
Austin 8 ton Roller KT-142
120 Hopton F6 Ford truck
P&H 150 Dragline 3/4 yd.
Bay City 25 Hoe 3/4 yd.
Hoe attach. for Koshring 204
Lorain L41 3/4 yd. Dragline
524T Vermeer Ditcher
4T Vermeer Ditcher

This equipment rebuilt in our modern plant by expert mechanics. Come see it!
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WHERE TO BUY

continued . . .

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1 only—Used TWM-3 Joy Challenger drills mounted on D4 Caterpillar tractor—24-500 drill—22" feed, 30" steel change, AW80 winch.
PRICE: \$12,000.00 ea.
PRICE without tractor: \$ 5,500.00 ea.

1 only—Used TWM-3 Joy drill mounted on three wheel rubber tired Ford tractor—TM-500 drill—MW-22A Feed, AW80 hoist.
PRICE: \$ 7,500.00

Above located at our warehouse.

CLYDE EQUIPMENT COMPANY
PORTLAND, OREGON
Phone: Capital 7-3561

FOR SALE

- 1 48" Wemco S.T. Classifier
- 1 Wilfley K pump, 4" with 20 H.P. motor & drive.
- 1 48" Wemco Duplex Classifier
- 1 Farrell-Bacon 30" x 15" Jaw Crusher
- 26" & 28" Belt conveyors complete with frame and drives; 300' minimum.
- 1 Jeffrey Flex tooth Crusher 24" x 20"
- 2 Gear Reducers—various sizes & speeds
- 2 108 H.P. Foote Bros. Gear reducers 8:23 to 1:0 ratio, 1750 RPM

ALEX MUSHKIN
100 State Highway, Moosic, Penna.

Marion 7200 & Manitowoc 4500 DRAGLINES
PLANTS: 200 TPH aggregate w/2230 jaw, 4 1/2" cone, Unit 880 Jr & 2850. Twin dual master, Pioneer 54V, Washing plant w/321 scrubber.
CRUSHERS: 9x3, 10x3, 10x6, 15x6, 18x6, 20x6, 24x6, 30x4, 42x4, 42x6, 48x6, 84x6 JAW, 32x3, 34x3 & 6K Allis, 25 1/2 & 37 1/2 KVS, 2'4", 16", 20", 2' & 4" Traylor, 12A, 25B Telsmith, GYR, 368 & 488 Gyroscopes.
DRYERS: 8x17, 5x24, 5x50, 7x20, 8x27, 8x125 Two 5 ton MONORAILS 1000' track
MILLS: Dixie 5000, Gruender 4XD Hammer, CR2020, 5900, 3645 & Penna CR 3-38 Impactors, Raymond 50 Imp, Bradley Jr & Sr.
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Rope Belt CONVEYOR 1236' long. Others.
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information
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NOTES FROM THE PUBLISHER

June, 1961

Dear Reader:

In previous letters, you have read my comments about the way labor gouges exhibitors at many of the conventions held throughout the land.

Last month I quoted from a number of letters I had received in response to my first reference to these labor practices which, in many cases, are "killing the goose that laid the golden egg."

Obviously, there are some cities that are better (or worse) than others in the treatment of exhibitors.

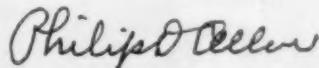
Also, there are some associations that have done a good job to see that the exhibitor gets a better break. For instance, the National Crushed Stone, National Sand & Gravel and National Ready Mixed Concrete Associations have recognized the plight of the exhibitor, and have made an honest effort to do something about it.

However, inequities do occur in many cases, in spite of the good work done by the several associations' and exhibitors' committees.

It behooves the cities in which conventions are held to convince labor that it should give an honest hour's work for an hour's wage—and, by this, I don't mean to have one worker and several helpers doing the work in an hour that ordinarily would take one person 10 minutes.

This series of letters is being sent to a number of the larger cities where conventions are held. Let's hope it produces some results.

Sincerely,



Philip D. Allen
Publisher



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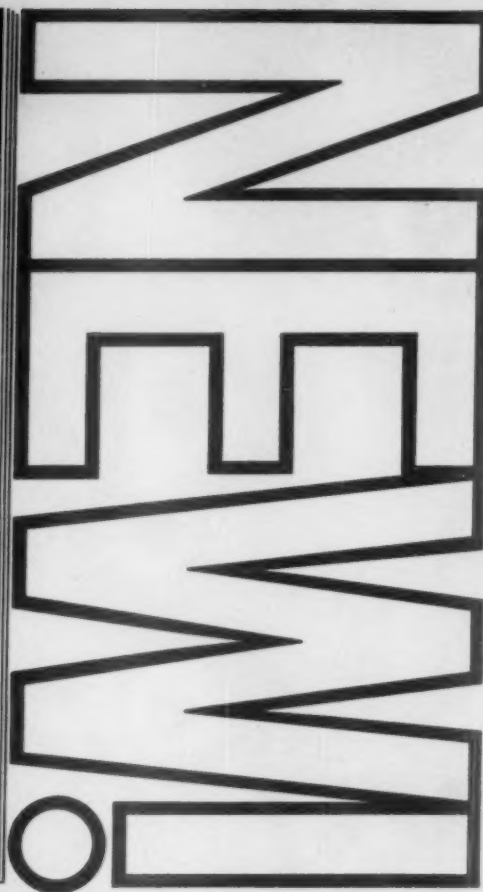
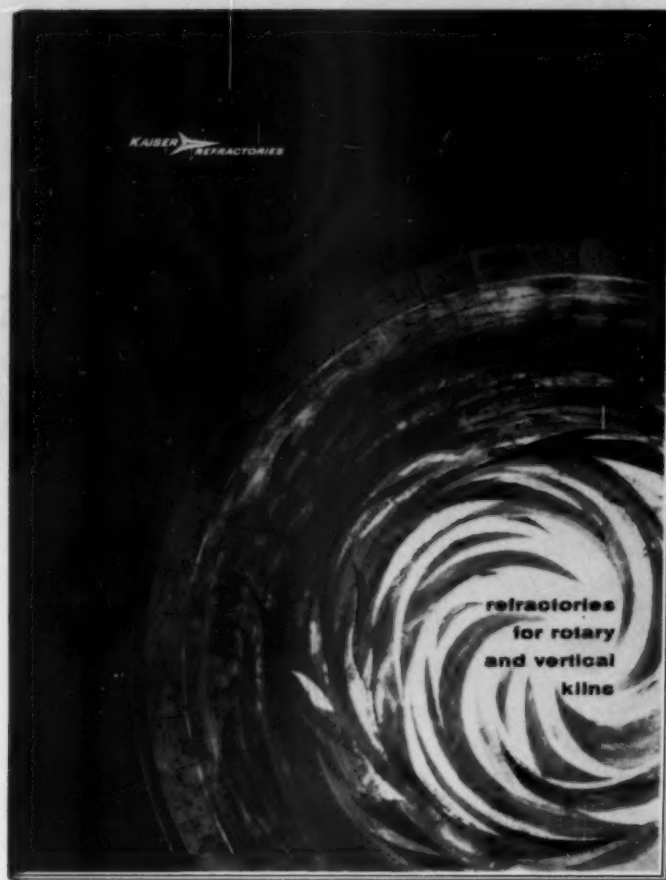
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